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ON THE REARING AND FEEDING OF CATTLE.

In our island, where the domestic animals enter so largely into the article of human food, a great part of the farmer's attention must be devoted to the rearing of them to the degree of perfection their ultimate use requires; for every labor bestowed on any kind of cultivation, and every article the farmer produces by the application of that labor, tends to the same result—the production of food for man and beast. Before the introduction of green crops, a very imperfect system of rearing prevailed, from want of succulent food for winter; grass-fed animals could only be brought to market, and if kept through winter they lost during that time the degree of condition they had acquired during summer; for hay and straw if used in profusion will not rear or feed the animals quickly and profitably. The cultivation of green crops has completely altered the whole system, and has introduced an entire revolution, both in the cultivation of the land, and in the management of the domestic animals, a better and more regular supply of food has been obtained, and a vast addition to the number and quality of every article produced on the farm. An improvement in the supply of food carried along with it corresponding improvements in the animals themselves, and on no point of rural economy has more skill and exertion been shown, or more persevering industry exercised, than we have witnessed by many breeders in this kingdom in improving the qualities of the animals, by intermixing and engrafting the properties of the one on the other, so as to develope and bring forth those qualities for the use of man. Our breeds of cattle are numerous, but the various crosses and remnants of old breeds need not be enumerated, and they may be reduced to the few breeds that are now most approved, and from which we may choose for any situation in the kingdom. For all rich soils and favored situations, the Durham breed, or short-horns are preferred, and the long-horns are still kept by many excellent cultivators. The Herefords and short-horns seem nearly balanced in merits, if we may judge from the prizes awarded them. For inferior lands we have the Devon breed, not surpassed by any cattle in the kingdom, and besides we have multitudes of nondescript animals, that do not fall under any class, but which are yet much used in all parts of the kingdom. In Scotland, where great numbers of cattle are reared and exported, the native breeds are three —the Ayrshire which are evidently allied to the Yorkshire breed—the Galloways, or polled blacks, and the West Highland breed of horned black, shaggy-haired animals, which are found, with some little variation, all over the western and northern Highlands of Scotland. Great numbers of these animals are fed in England; and an opinion is entertained, and my own experience goes far in support of it, that these mountain cattle pay more money per head and per acre, than any of our fine breeds, after all the improvements that have been made. The cost of production is small and the beef commands a higher price in the market. In bringing cattle forward to the state when they are disposed of to the consumer, farmers have adopted two methods; some prefer to breed and feed on the farm, a number that the farm can support, and others to buy yearly a number they can afford to feed. The preference given to either of the two methods would seem to be, or should be, determined by locality and other circumstances; yet caprice and fancy would seem to do much, for it is hard to conceive how two farms adjoining each other should be suitable to different modes except in the bare opinion of the farmer, or how two breeds of animals can be most profitable in similar cases, except in opinion only. In many situations the difference to be observed between breeding and feeding, is most marked, and it is very fortunate that the diversity of opinion prevails in other places, for it affords a ready market for our mountain breeds, which if the case was otherwise, might not be so profitable. In choosing a native breed, the farmer will be guided by the quality of the soil, the food he can produce, and by other circumstances, and much will depend on his own fancy; but if he prefer to buy in, rather than breed, it will be found that the Scotch polled and West Highland breed will pay more money than any other. A very general mistake is committed in not allowing them sufficient time on the land, in order to feed—not less than eighteen months should be allowed, or twelve in cases where they have been bought in good condition. Green crops being now known to us, which if duly cultivated will afford succulent food during winter, it is understood that no farmer neglects providing a sufficient quantity if he wishes to rear and feed profitably, not only with regard to the profits of the animals itself, but to the manure raised for the future benefit of the farm. But notwithstanding the long acknowledged profits of these crops and also of improved breeds of stock, we find great neglect prevail on both points; for if we look into Smithfield, or any other market, we find the improved animals bear a small proportion to the others; farmers yet persist in breeding very unthrifty animals, and for want of green crops they are bred and starved upon a system. In many cases however, we find both breeding and feeding carried on systematically and profitably, with due attention to the profits expected from the animal itself, from the attention and food bestowed, and also to the future benefits expected from the system.

Cow-sheds should be provided with calf-pens adjoining, under the same roof, where the calves are confined in separate apartments for one animal, and floored with boards, pierced with auger holes that they may lay dry and comfortable. From these apartments they are brought twice or thrice a day to be suckled, led by a halter, and tied, when sucking, to a rope extended along the cow-shed. Suckling is always to be preferred to nursing by the pail; when milk is exposed, much of the value is lost, the gaseous fluids go off by evaporation, and the appearance of the calves nursed by the two methods is a sufficient decision. Suckling is

attended with less trouble, and an experienced cowman will soon be able to judge of the proper quantity to be allowed them. From January to June is the proper time for weaning—early calves maintaining a decided superiority unless greater encouragement be afterwards afforded to the later ones. In situations where fattening for veal is found profitable, both weaning and fattening go on together; and even where cheese and butter are manufactured, all the three may be easily managed, by allotting a number of cows for suckling and a number to be milked for the dairy. Calves fed for veal must not be restricted in the quantity of milk; for weaning, they must be allowed such a quantity as will keep them always in a sleek and thriving condition, without fatting them, for any fat produced at that time would be lost. An ordinary cow will feed four calves for veal, or make veal of two and wean three, much depending on the milky nature of the cow, and on the quality of the pasture. The various substitutes for milk that have been puffed abroad among farmers have all proved an utter fallacy, only supplying the farmer with a few pounds of butter and cheese at the expense of the animal. They never fail in producing a large belly and offal, an infallible mark of degeneracy and bad keep, in any animal, and in no case have we been yet able to improve upon what nature has provided the mother with in nursing her offspring. During that time the mother should form the chief object of our attention.

In the month of May, when the weather has become warm, and the young grass has sprung, the earliest calves will be turned out into a grass paddock of fine pasture, provided with water and shelter, and convenient to the homestead, and where they can be suckled twice a day. The cow's pasture should be adjacent if possible, and also well provided with water and shelter, and laid down or improved for the purpose. The paddock for the calves may consist of one or two acres, and an orchard suits very well, the fruit trees affording shelter from the heat, and amusement in rubbing. A shelter shed is indispensable, with a dry well littered bottom, and may be so contrived, as to suit for lambing the ewes in the spring, which business will be concluded before the calves are turned out. The ewes lying all night in the paddock, will bestow a good top dressing, which must be attended to by rolling. At the age of 16 weeks the calves will be ready to go to the pasture field, the quantity of milk having been gradually reduced as the calves learned to eat the grass. As they are removed from the paddock the next oldest ones are turned out from the calf-pens, and when the weaning season is near a close, as many of the latest calves as the paddock can maintain may remain in it for the season, to be near at hand for receiving some better encouragement to raise them to an equality with the oldest. Nothing more disfigures a herd of cattle as to see them of different sizes and qualities, and colors, and in many cases of different breeds, showing a great want of skill in the breeding, and of care and attention in the nursing and rearing. After the weaning season is over, the milk for the remainder of the season may be applied to suckling for veal, or to making butter and cheese, as situation may direct. In places where these articles are the staple produce, the weaning of calves will be on a smaller scale; but on these farms some are weaned, to which the above observations will equally apply.

When the calves are removed from the home paddock, the best pasture on the farm will be given them, well watered and sheltered if possible; in many cases the lattermath of a hay crop answers well. When fields lie in permanent grass, a shed with a view to permanency may be erected in each field at a very trifling cost, and may be so contrived as to suit both cattle and sheep. Where the alternate system of farming prevails, a corner where the plough does not strike, may be got, and a very useful shelter erected. Cattle of an age should pasture together, and the smaller the lots the better.

By the end of October, the approach of cold weather will render necessary the removal of the cattle to the home yard. Every farm is, or ought to be, provided with a number of yards suited to its size and to the quality of the soil, the bottoms level with that of the shelter-shed, raised above that of the yard, to throw the moisture outwards, that the cattle may lie dry; cribs for holding the roots given to the cattle are ranged along the subdivision walls, and sometimes placed in the shelter-shed under cover; the most approved are of a square shape with a latticed bottom, which allows all moisture to escape. Buildings of stone and lime have been erected along the walls, but they hold water and sludge very much; wood is cleaner, and where used, the bottom planks should be perforated with holes to discharge the water. Troughs of stone, of wood, or of cast iron, are placed across the division walls, so as to supply two yards; and the water is conveyed in pipes from a pump, or supplied by ball cocks and pipes from a cistern placed aloft for that purpose, in some house of the farmery, and to which the water is raised by a forcing valve in the yard pump. Turnips are now mostly given in a cut state, and where straw is rank and abundant, it may be cut to shorter lengths, which will render it more manageable and easier of reduction.

Into these yards properly furnished, the cattle are put in lots of ages and sizes, varying in number from 3 to 7 when feeding; young cattle may be kept in greater numbers. Most feeders now prefer the open yard to housing, though on turnip farms, a feeding house is very necessary where a few choice animals may be fattened, or a few inferior ones may be brought more quickly to perfection. Fresh straw should be put frequently into the racks, and cabbages are a very proper article to begin the feeding of young stock for the first winter. These and turnip tops are given once, and better if twice a day, and continued through the winter—if they fail, potatoes and beets are given in moderate quantities, so as to keep the young animals in a sleek and thriving condition, without any tendency to gorge them, or induce them to nauseate their food. They should always show a keen appetite, and seem able to eat more than is given. The yards are frequently littered, thinly at a time, so as to keep them dry and comfortable, and also mix the manure properly. The straw racks are shifted often, that the straw may not lie dry around them, and the yards are of such a size as will admit of the cattle treading, dunging, and watering on every part. A very common error prevails on this point, the yards are much too large, the straw lies dry and unmixed in many parts, and the good dung lies huddled together in the other places. Space sufficient for the cattle to

move about freely for air and exercise is quite enough, due regard being had to warmth in the shelter-shed. An equal mistake with too much space lies in making the yards too small.

In the month of May of each year the pasture fields will be ready for stocking, when the different sizes and ages will be arranged by the best judgment of the farmer. In October of each year, the cattle will be turned into the fold-yards, and fed with ample allowances of roots and straw, and with the yards kept dry and comfortable. As the cattle increase in age, the fewer numbers must be put together in one yard, and during the third and fourth winter, they will be fed off and sold. I have recommended all calves to suck the cow for veal or for weaning, and I now mention that the treatment of any animal during the first year of its growth generally stamps its future distinction. If it be stinted in the quantity or in the quality of the food, future pampering will not recover its lost growth; and if it be well fed during the first year, and attain a good size, indifferent treatment afterwards will have much less effect. If a calf be well suckled, great attention is necessary during the first winter that it receive such treatment as will carry it forward, and that it does not lose in that time what it gained the previous summer. This result often happens from want of winter food of roots; for though hay and straw be in profusion, they never can supply the place of green crops.

Cattle when feeding must have a full supply of food, but not to pall their appetites, which must always be keen and in full action. The food previously given them should be clean eaten up, or nearly so, before any more be supplied, and the cribs regularly cleaned out and every filth removed. The first feed of cut turnips, potatoes, or beet, is given by the break of day, and the last so long before darkness sets in as will allow time for the cattle to eat the whole during day-light, as any accidents from hoving or choking have a better chance of being seen and remedied. A dry bed in the shelter-shed, and in any part of the yard during dry weather, is indispensable.

Opinions differ as to the most profitable age of feeding our best breeds of cattle. My own experience agrees with the opinion expressed by Earl Spencer, one of our highest authorities, that the age of four years seems the most advantageous, as the most likely to secure the utmost weight of the animal, and to avoid unnecessary expenditure in trying to obtain more bulk, and also the loss by slaughtering at too early an age, before the animal had reached maturity. I have observed that a great part of our cattle are starved on system—they are grazed and gain something in summer, and lose it in winter. The miserable appearance of young stock, both in the yard and in the fields, sufficiently support this opinion, and the case will not be mended till green crops are more extensively cultivated. We know plants adapted I may say to almost every soil, and it only remains to cultivate them. In order to produce a thoroughly well fed and ripe animal it must be gradually fed from the day of its birth, by good keeping, which will keep the body in a thriving condition and full of juices, and also produce that mixture of fat and lean so necessary to constitute beef of good quality. Hence arises the well furnished animal in the hands of the butcher, and from the starving system is owing the bad quality of much of our animal food; for unless the animal be well fattened and regularly, the lean is dry and wholly wanting in juices, which can only be imparted by a ripe state. The one-half at least of our cattle in market are not fat; they are starved in early years, and then for a short time they are tied to a stake and gorged with food to produce an appearance quickly, and sold off to save expense; and hence arises the badly furnished animal in the hands of the butcher. An animal always in good condition is fattening gradually and profitably, the dung is of more value, and when the age of fattening off arrives, a small application of more food concludes the process. A greater number of cattle is often kept on a farm that it can maintain profitably—an erroneous policy, but very common.

I have observed that where a farmer chooses partly or wholly to follow the buying system in place of breeding, it will be found that our small mountain breeds will pay more money than any other. In most cases, too short a time is allowed them to feed, for the natural propensity to fatten has not been in them any way improved by breeding or keeping, and in that respect they differ from our new breeds. They are mostly fed very poorly in their youth, and when transported to rich pastures, fat cannot be laid instantly; but in course of time, if in fair condition, a year will be sufficient, but if bought in a lean state from droves, they should be on the ground for 18 months, fed the first winter on half the full allowance of green food, well grazed the following summer, and fed off the ensuing winter. This is gradual feeding, and indispensible, if we wish for good beef. The age should be four or rather five years when slaughtered.

Oil cake, bean, and barley meal, oats, and other articles have been used in the feeding of cattle, but experience has long since proved that if the farmer will only try to raise potatoes, beet, cabbages, and turnips in quantity, he needs no substitute, except in case of a failure of the above crops. Straw alone is required for litter, and for the cattle to eat a little when inclined. J. D.

HISTORY OF SUGAR.

From the North American Review.

Within the present century has commenced a revolution, which may prove to be of very different importance from what has yet generally been supposed, in respect to a leading article in the commerce and domestic economy of civilized men. It has now arrived at a stage, at which it furnishes some data for answering the questions, how far it is likely to proceed, and what are to be its effects upon the employment, subsistence, comfort and wealth of nations.

The commercial and economical importance of sugar is of modern date. It was known to the Greeks and Romans as a medicinal substance, but not as food or a condiment. Herodotus informs us, that the Zygantes, a people of Africa, had, "besides honey of bees, a much greater quantity made by men." This was probably sugar, but not brought to a state of crystallization. Nearchus, the admiral of Alexander, "discovered concerning canes, that they make honey without bees." Megasthenes, quoted by Strabo, speaks,

300 B. C., of "India stone, sweeter than figs and honey." The Ophrastus, in a fragment preserved by Photius, describes sugar as "a honey contained in reeds." Eratosthenes, also cited by Strabo, and after him, Terentius Varro, are supposed to have meant sugar-canes by "roots of large reeds growing in India, sweet to the taste, both when raw and when boiled, and affording, by pressure, a juice incomparably sweeter than honey."

Near the commencement of the Christian era, sugar was first mentioned under an appropriate name and form. "In India and Arabia Felix," writes Dioscorides, "a kind of concrete honey is called *saccharon*. It is found in reeds, and resembles salt in solidity, and in friableness between the teeth.' After this, so learned a man as Seneca fell back into fable on this subject. His account is this: "It is said that in India, honey is found on the leaves of reeds, either desposited there by the dews of heaven, or generated in the sweet juice and fatness of the reed itself." Pliny, whose special study led him to look more carefully into the matter, gives all that the ancients knew about it, and a little more. "Arabia," he observes, "produces *saccharum*, but not so good as India. It is a honey, collected on reeds, like the gums. It is white, crumbles in the teeth, and when largest is of the size of a hazel-nut. It is used in medicine only." Afterwards Archigenes mentioned it, as "India salt, resembling common salt in color and consistency, but, in taste and flavor, honey." Galen calls it *sacchar*, and says it was "a production of India and Arabia the Blest." The author of the "Periplus of the Erythean Sea" includes it, under the name of *sacchari*, in a list of articles, constituting the commerce between hither India, and the ports of that sea.

If the assertion, that sugar was used in antiquity as a medicament only, needed confirmation, we might find it in the fact, that the subject is not mentioned except by physicans and men of universal learning, nor with tolerable precision by the former. None of them allude to any artificial process in the preparation of it. Ælian, about the middle of the second century, is the first who mentions the use of mechanical art in the extraction of the juice of the cane, and he is likewise the first who attempts to fix the seat of its culture. He tells us, that sugar is "honey pressed from reeds, which are cultivated by the Prasii, a people dwelling near the mouth of the Ganges."

The Jewish histories make no mention of sugar. The only sweet condiment, used by the Hebrews, was honey. But it may have been in part "honey made by men;" for the Rabbins understand thereby not only the honey of bees, but also sirups, made from the fruit of the palm-tree.

During several centuries succeeding the Augustan age, no extension of the knowledge or use of sugar appears to have taken place. It is occasionally spoken of, but to the same effect as by the Greek physicans of that age. So late as the 7th century Paul of Ægina calls it "India salt," and borrows the description of Archigenes.

At this time a new power appeared on the theatre of nations. The Saracens conquered and occupied western Asia, northern Africa, and southern Europe. Their empire was scarcely inferior to that of Rome, in the period of her greatest prosperity and rapacity. They pushed their conquests to the Garonne and the Rhone, to Amalfi, and the islands of the Levant and the Ægean sea.

To these ingenious barbarians the world is indebted for the modern manufacture and commerce of sugar. It is not known at what time they themselves became acquainted with it. Some authors have asserted, that it was not until the thirteenth century, and that the sugar cane and the art of extracting and elaborating the juice, were conferred upon the Europeans by the crusaders, or by the merchant adventurers, who penetrated the Indies after the return of Marco Polo. Each of these assertions has been vaguely received; but a little attention will satisfy every inquirer, that neither of them is true.

We have seen, that several of the ancients, best acquainted with the subject, couple Arabia Felix with India as a source of *saccharum*. Arabian writers of the ninth and tenth centuries speak of sugar as common in their times. In the year 906, the sugar-cane was cultivated, and sugar manufactured, at Ormuz in Caramania, a province of the eastern Caliphate. An Arabian author of the western Caliphate, who composed a treatise on agriculture about the year 1140, and who quotes another writer of his nation of the year 1073, gives full and precise directions for raising canes and manufacturing sugar. From all which, Loudon concludes, that sugar has been cultivated in Spain upwards of seven hundred years, and probably as as much as one thousand years. Salmasius declares, in 1660, that the Arabs had made our modern sugar more than eight hundred years.

One of the Christian historians of the Crusades, in the year 1100, states that the soldiers of the cross found in Syria certain reeds, called *canameles*, of which it was reported that "a kind of wild honey was made." Another, in 1108, says: "The crusaders found honey reeds, in great quantity, in the meadows of Tripoli, in Syria, which reeds were called *sucra*. These they sucked, and were much pleased with the taste thereof, and could scarcely be satisfied with it. This plant is cultivated with great labor of the husbandmen every year. At the time of the harvest they bruise it, when ripe, in mortars, and set by the strained juice in vessels until it is concreted in the form of snow or salt." The same historian relates, that eleven camels laden with sugar were captured by the Christians. A similar adventure happened to Richard Cœur-de-Lion, in the second crusade. A third writer, in 1124, tells us, that in "Syria reeds grow that are full of honey; by which is meant a sweet juice, which by pressure of a screw engine, and concreted by fire, becomes sugar." These are the earliest notices of the method of making sugar; and they refer to an apparatus and to processes used in the Saracen empire, and not known at that time, so far as European records show, to be used any where else. At the same time sugar was made at Tyre in Syria, then subject to the Saracens; and, in 1169, that city is mentioned as "famous for excellent sugar."

The island of Sicily was the first spot upon which the sugar-cane is known to have been planted in Europe, though it is altogether likely, that it was planted by the Moors fully as early, if not earlier, in Spain and Portugal. That island was conquered by the Saracens in the early part of the ninth century, and was retaken by the Normans at the close of eleventh. Immediately after that event we find, that large quantities of sugar

were made there. According to records still extant, William, the second king of Sicily, in 1166, made a donation to the convent of St. Benedict of "a sugar-mill, with all the workmen, privileges, and appurtenances thereto belonging."

If it was the crusaders who brought the sugar culture to Europe, how happened it, seeing that they were collected from all Europe, that no other part of that continent except Spain in the hands of the Arabs, and no other island of the Mediterranean except Crete, captured in the year 823, by an expedition from Spain, were favored with that invaluable donation? It was not until three hundred years later, that it found its way into Cyprus, Rhodes, and the Morea, and this extension was not owing to rural tastes, or the spirit of improvement among the feudal barbarians, but to the commercial enterprise of the Venetians, who had for a long time carried on a lucrative trade in the article with India, Syria, Egypt, and Sicily, and were now, by conquest or purchase, the possessors of Crete, and the latter seats of the sugar culture above mentioned.

It may be further remarked, that the most important and profitable of the manufacturing arts have never been propagated except by conquest or emigration. The woollen business was established in England by the weavers, fullers, and dyers, whom the frantic tyranny of the counts of Flanders and their French allies drove, and the wise policy of the Henries and Edwards welcomed, to England. The cotton manufacture, derived to the Arabians from Hindostan, was by them diffused over Africa, and fixed in Europe; and thence brought by an exterprising operative to the United States. It seems scarcely credible that those half-naked, hard-riding demons, who are so often employed in stripping unfortunate Christians to the skin, are the identical people to whom Christendom is indepted for the comfort of a shirt. Such, however is the fact. The Arabs conferred upon us that grateful, and now ornamental garment.

It was not until the time of Justinian, five hundred years after silk was known and purchased at enormous prices at Rome, that the silk culture was brought into the Eastern Empire by two Persian monks, who had pursued it in China. It was established in Italy by a colony of Greek captives, and carried from Milan to Lyons by a company of Italian workmen, engaged by Francis I. Finally, the Huguenots fled from treachery and intolerance to impart their skill to Spitalfields. The silk manufacture is more simple and cheap than that of sugar has hitherto been, and yet it required twelve hundred years to travel from Constantinople to London; and it has but just reached our shores after two hundred years more.

It may help us to form some adequate notion of the difficulty with which the manufacturing arts are propagated, if we reflect how hard it was to naturalize the cotton and wollen manufactures in the United States, and how far they still are from that fineness and finish, to which they attain in the workshops of Europe. Yet we speak a common language, are descended from common ancestors, and have always had close commercial and social relations with our teachers. How much greater must have been the difficulty and delay, if we had been strangers in origin and language, and enemies in religion.

The use of alkalies, in the clarification of the juice of the cane, was an invention of the Arabs. The original raw sugar of the east was debased by a mixture of mucilagineous matter, which opposed itself to the crystallization of the sugar, and determined it to a speedy decomposition after it was crystallized. To this day the eastern sugar, except where the manufacture is directed by Europeans, or where the product has been converted by the Chinese into what we commonly call "rock candy," is much inferior to that of the west in purity, and in strength of grain. The only clarification, which the liquor appears to have undergone in the hands of the eastern manipulators, was by skimming during the processes of evaporation and boiling. And if we may judge from the imperfect and loose descriptions of modern travellers, this is the extent of their knowledge at the present day. They seem to know no other method of clarification in making sugar, and no art of refining except that of making candy.

How the Arabs came to adopt a different method, it is perhaps impossible at this day to determine. Discoveries of this nature do not readily obtain publicity in any country. They are usually involved in as much mystery, and kept under a monoply as long as possible. Another characteristic of the Arabian method was the use of earthen moulds, of a conical form, for crystallizing and curing the sugar. In the east, broad, earthen dishes were used for those purposes. These two characteristics of the Arabian method have come to us through the Spanish and Portuguese; and whence should they have derived them, except from the Arabs, Moors, or Saracens? different names given to the same people from the relations to places and to people, which they successively maintained. *Arabs* (according to a probable etymolygy of the word) means *westerns*, because this people inhabited the *west* of Asia. When they had spread over the north of Africa, and occupied the remotest Hesperia of the Ancient world, the body of their nation was, in respect to the emigrants, *eastern*, and that is the signification of *Saracens*. *Moors* was a name given to them by the Spaniards and other Europeans, from the circumstance of their having conquered and converted the inhabitants of Mauritania or Morocco, incorporated them with their army, and issued immediately from their territory to take possession of Spain, Portugal, part of France and of Italy, Sicily, and the islands of the Ægæan Sea.

We have seen, that the Arabs had the art of cultivating the cane, and converting it into sugar. We know that the sugar-canes, called "the chief ornament of Moorish husbandry," are still cultivated in Spain, and the sugar manufactured. It is likewise made in large quantities on the river Suz, in Morocco; and at Teycut or Tattah, constitutes a leading article of traffic with caravans, which traverse the great desert, and Timbuctoo and other markets of Central Africa. Sugar is still a production of considerable importance in Egypt, particularly in the district of Fayoum, and, until lately, the Seraglio at Constantinople was furnished thence with the nicest refined sugar. In 1560, sugar was imported at Antwerp from Portugal and Barbary. At the same period it was an article of extensive manufacture and traffic at Thebes, Daretta, and Dongola in Nubia and Upper Egypt. All these are undoubtedly the remains of the Arabian plantations.

The Spanish and Portuguese word for sugar is *azucar*, *acucar*, or *assucar*, and the Arabic *assokar* or *shuker*. This was derived from the Sanscript, *sharkara* or *sarkara*, meaning, in the primitives *sweet salt*, and giving rise in antiquity to the terms *saccharon*, *sacchar*, *sacchari*, *saccharum*, and "India salt." The Arabic *shuker* is, with slight modifications, a universal term, except in China and the Malayan archipelago; proof enough that we received this commodity, and the art of preparing it, from neither of them, and that we and all the western nations are indebted for it to the Arabs, and through them to the Hindoos. The difference between the Spanish and the Portugese word, and other European names, is owing to the circumstance, that the two nations in close contact with the Arabs, incorporated the article *a* or *al* with the substantive, before which they heard it, as they did in a great many other instances, *algodon*, for example, which is properly *godon*, *goton*, or *koton*. The etymology of *melasses* will furtheir illustrate our position, that we derive the art of sugar making from the Spaniards and Portuguese, and through them from the Arabians. *Melasses*, more frequently, but incorrectly, spelt, *molasses*, is an abreviation of *mel de assucar*, signifying, in Spanish and Portuguse, *the honey of sugar*.

The Portuguese, under the anspices of Dom Henry, transplanted the sugar-cane from Sicily, as it is commonly supposed, though it might be from Portugal itself, to the islands of Madeira and St. Thomas. Herrera has raised great doubt of the historical correctness of the idea, that Sicily was resorted to at that that time for sugar-canes. He declares positively, that they were carried to the Africo-Atlantic islands "from Granada, where they had been planted by the Moors."

It has been a subject of much dispute, whether the sugar cane was introduced into America from Europe, Asia, or Africa, or whether it is indiginous here. The former is the opinion of all the historians of the old world, the latter of all the explorers of the new. Edwards reconciles them by supposing that both are true, which seems to be the most reasonable conclusion. It would be as absurd to suppose, that the early European settlers of America would fail to carry that plant, with whose great value and agreeable uses they had just become well acquainted, to their new abode, especially when they were growing and were worked up in great quantities in the Canaries, whence all the adventurers were accustomed to take their departure, as it would to question the authority of the writers, who positively affirm this fact. On the other hand, it would be an extravagant stretch of incredulity to doubt the clear testimony of the many eye witnesses, who declare, that they found native sugar canes in Guadaloupe, St. Vincent, Brazil, on the La Plata, and on the Mississippi; or the demonstration of Cook and Bougainville, who brought a native and valuable variety from the Friendly Islands, to the British and French West Indies.

It is asserted by some, that the plant was carried from Brazil to St. Domingo, having been previously brought to the former from the Portuguese kingdom of Angola, where it is still cultivated, or from the Portuguese possessions in Asia, where Vasco de Gama and his successors, the conquerors of a great part of India, found sugar cane in abundance. Whencesoever the sugar cane came to St. Domingo, or whether it came at all, it is certain, that a company of sugar makers were carried from Palm Island, one of the Canaries, to establish the manufacture in that oldest, except Brazil, of the American settlements.

It is an interesting fact, that the art of sugar making, propagated, we must conclude, both *east* and *west* from Asia, now completed, in opposite directions, the circumnavigation of the globe; for, a few years after this establishment in St. Domingo, Cortez found, that both sirup and sugar were made from the stalks of maize, by the natives of Mexico, and sold in their markets. The aborigines of Virginia, and probably of all north America, had the knowledge of making sugar from the juice of the maple. From them the Anglo-American settlers undoubtedly derived it.

In 1643, the English began the sugar business in Barbadoes, and, in 1648, the French, in Guadaloupe. The Dutch, expelled from Brazil, where they manufactured sugar in the sixteenth century, took refuge in Cuia̲ao, St. Eustatia, and other islands, and finally, upon the exchange of New Amsterdam for English Guiana, in Surinam. To all these they transferred a branch of industry, which they had learned to practice, and knew how to appreciate.

It is not known at what time the use of sugar began in England. It was probably as late as the fourteenth century. At that time it begins to take, in trope and verse, the place which honey had occupied, without a rival, since Moses and Homer. Chaucer uses the epithet "sugreed over." The chamberlain of Scotland, in 1329, speaks of loaves of sugar sold in that country at one once of silver, equal to four dollars of our money, per pound. In 1333, white sugar appears among the household expenses of Humbert, a nobleman of Vienne, and it is mentioned by Eustace Deschamps as among the heaviest expenses of housekeeping. George Peale tells us, that sugar with wine was a common drink in the sixteenth century. It did not become an article of ordinary consumption until the beginning of the seventeeth century. At that period, the Venetians imported it from Sicily and Egypt, and probably produced it in Cyprus, Crete and the Morea. One of their countrymen, about two centuries before, had invented the art of refining, for which he received the sum of one hundred thousand ducats, equal to three or four hundred thousand dollars at the present time. Previously to this they had pursued the Chinese method, and made candy only. This inventor adopted the cones from the Arabians, and probable obtained from their manner of clarification the idea, upon which he so far improved as to effect at last the complete purification of his product. It was from the Venetian refineries, that France and England procured their small and high priced supplies in the fourteenth and fifteenth centuries.

By the creation of sugar plantations in the Portuguese and Spanish islands of Madeira, St. Thomas, and the Canaries, the stock was considerably increased. We begin then, for the first time, to have accounts of the number of sugar mills, and the quantities manufactured. Thus we are told, that in the islands of St. Thomas there were, in 1524, seventy mills, making on an average 66,428 lbs. each, and upwards of two thousand tons in all. It was from those islands, that

Europe was for half a century mainly supplied. But the rapid exhaustion of the soils seems inseparable from the cultivation of the cane with the labor of slaves and serfs. It is reasonable to suppose, that this was the great cause of the successive migrations of this business westward, and its early decline in Sicily, Spain, and the Africo-Atlantic islands.

In St. Domingo there were, in 1518, twenty-eight sugar presses. In about half a century, this island succeeded to the inheritance of the markets of Europe, which it monopolized and enlarged during a century and a half, exporting sixty-five thousand tons in one year, being about 100,000,080 lbs. surplus, after supplying the demand of the mother country. In any possible situation of that island, it could not have maintained until this time that monopoly, and that rate of production. At the beginning of the present century, the entire exportation from the West Indies and American settlements of every description, was 440,800,000 lbs; now it is 400,000,000 lbs. from the British West Indies alone, and 700,000,000 lbs. more from Brazil and the Spanish, French, Dutch, and Danish colonies. In 1750, only 80,000,000 lbs. were exported from the British West Indies, one-fifth of the present export.

Of course the consumption of sugar has greatly increased during the last half century; and it seems destined to an indefinite extension. It is so nutritive, wholesome, and agreeable, that there can never be a limit to its use except in a prohibition or an inability to buy it. Men and nations differ widely in their tastes and habits in respect to most kinds of food, sauce, and drinks. Neither wheat, rice, flesh, nor potatoes can command unanimous favor. No article of housekeeping, save sugar, can be named, which is universally acceptable, to the infant and the aged, the civilized and the savage.

The population of the British West Indies is equal to that of Cuba; but their consumption of sugar was, in 1827, only 13,000,000, lbs., eighteen pounds to an inhabitant, while that of Cuba was, in the same year, 44,000,000 lbs., or sixty-three pounds to an inhabitant. This difference is presumed to be owing to the predominance of the free over the slave population, in the latter islands. The ratio of the free population of Cuba to the slave, is three to one; but in the British West Indies, one to three. This proportion would give the difference of the quantities of sugar consumed, with almost entire accuracy.

The population of all the sugar growing countries in the world is about 468,000,000. It is not to be presumed, that each individual of this number consumes as much as the luxurious West Indian; but it will not be extravagant to suppose, that they all consume as largely as the Mexicans. Mexico, by the lowness of wages, and the ignorance and poverty of the mass, may be considered as a fair representative of the nations, inhabiting that belt of the earth producing sugar canes. She consumes, according to M. Humboldt, ten pounds to an inhabitant, all of domestic production. We thus determine proximately that the consumption of the other Hispano-American nations, and of the swarms which people the east, is 5,000,000,000 lbs. per annum, nearly four times as much as is used in Europe and the United States. Great Britain consumes 400,000,000 lbs., about twenty-four pounds to each inhabitant; the United States 200,000,000 lbs., sixteen pounds to an inhabitant; our domestic production being estimated at 50,000 hhds., or 50,000,000 lbs. In Ireland, the consumption is 40 millions of pounds, five pounds to an individual In Russia, it is much less, being but a little more than one pound to a person, and 60 million in the whole, unless the article be introduced inland from China, by way of Kiachta, as to some extent it probably is. Of the quantity consumed in Russia, we suppose 8 millions of pounds to be beet sugar. Belgium consumes 30 millions of pounds, seven pounds to an inhabitant, of which 5 millions of pounds are beet; and Prussia, Austria, and the rest of Germany, 200 millions of pounds, of which 20 millions may be beet. This is four pounds and a half to an inhabitant. Holland consumes 50,000,000 lbs., sixteen pounds to an inhabitant; Spain, the same, which is but four pounds to an inhabitant; France, 230,304,549 lbs., seven pounds to each inhabitant. Of this, 107,905,785 lbs. were, in 1836, made from beet roots. With the exception of a few manufactories in Italy, the above figures show the extent of the beet sugar culture. Thus we have, for the total consumption of sugar in Europe, 1,267,000,000 lbs., of which 140,000,000, or 62,500 tons, are beet sugar; and, for the total consumption throughout the world, 6,267,000,000 lbs., worth, at six cents a pound, $376,020,000.

The cost of the production of cane sugar varies. It depends mainly on the price of labor. In the east, where labor is from 6 to 10 cents a day, sugar costs to the manufacturer from 1 to 2 cents a pound. In the Americas, where, with the exception of the Hispano-American republics, no wages until very recently have been paid to the laborer, the cost is 3 cents a pound. The price for exportation will average 3½ cents in the East Indies, and 4¾ in the West Indies and other sugar-growing portions of America. These prices include the profits of the native or resident merchant. The average cost to the importer, exclusive of duty is from 5 to 5½ cents for muscovado and brown sugar, and 7 to 8 cents for white. These prices include freight, insurance, and commissions. Add thereto the respective custom house duties, and we shall have the wholesale prices of every country. Thus the duty in the United States is 2½ cents on brown sugar; add this to 5 and 5½, and we have 7½ and 8, the average wholesale prices of New York, Boston and Philladelphia. The duty on clayed sugar is 3½ cents; add this to the above price, and we have 10 to 12 cents, the ordinary price of white clayed sugars. In France, the duty on brown sugar is 4¼ cents; in England, it is 4¾; consequently, in the markets of those countries, they cannot be at less than from 9 to 10, and 10 to 11 cents respectively. The grocers put on 2 cents more, so that the article costs to the consumer,

In the United States,	from 9 to 10	cents.
France,	11 to 12	"
England,	12 to 13	"
Hamburg, a free port,	7 to 8	"

Thus, sugar costs the consumer, in the United States, double the price of importation; and in France and England, two and a half times that price. In Prussia, the duty is the same as in Great Britain; but in Russia, according to the price the article bears there, it cannot be less than 7½ cents per pound.

The consumption of molasses is trifling, except in the United States and Great Britain.—There is some vent for it on the continent, to be used in curing tobacco; and in England it is used for making a bastard sugar, and for cheap preserves. In the United States alone it is used for the table. The quantity of refined sugar consumed in the United States is small compared with the brown. It probably does not exceed one-tenth; while, on the contrary, in France it constitutes four-fifths of the entire consumption. The proportion is less than this in Great Britain; but it is much greater there, and in Europe generally, than in the United States. Brown sugar contains, on an average, three to five per cent. of dirt; of course, molasses cannot be *more* pure. The consumption of this last in the United States, is about 150,000,000 lbs. annually; but probably more than half of it has heretofore been distilled into rum, producing more than 10,000,000 gallons per annum.

The sugar cane appears to have been, in all ages, a source of beverage in some form. Lucan describes the eastern recruits of Pompey's army thus,

—"quique bibunt tenera ab arundine succos"

The Jews had an inebriating liquor which they called *sacar*, from which some etymologists in fact derive *saccharum*, but we think erroneously; because it is certain, that the ancient sugar, with its name *saccharon*, came from India, and equally certain, that the Jews knew not sugar. It is not improbable, however, that some relationship exists between the Hebrew *sacar*, and the Hindoo *sharkara*, or *sarkara*; inasmuch as the drink, expressed by the former, was the juice of a reed, and, before fermentation, sweet. Bruce found the cane used in Egypt and Nubia for making a drink, by concocting it in water. The inhabitants of Angola have made a similar use of it from time immemorial; so too did the ancient Ethiopians. The people of all countries are fond of chewing and sucking sugar canes. The laborers every where grow fat towards the maturity, and during the cropping of the sugar cane. The Arabian horses were observed to grow fat in Spain by feeding on the pulp, after the juice was expressed. Sugar, eaten in considerable quantities, has the same effect. The king of Cochin-China causes his body-guard, consisting of a hundred men, to feed mostly on sugar and sugar canes, in order that they may appear more stout and handsome than other troops. Many aged persons have found great benefit from the free use of sugar. It tends to render the skin and cartilages soft and supple. It might be excellent nourishment for patients submitting to experiments upon distorted limbs or spine. It is slightly laxative, and was valued on that account by the ancient practitioners. Dissolved in water it is an antidote against arsenic, corrosive sublimate, verdigris, blue vitriol, and other mineral poisons, and also those of fish, as lobster, dolphin, conger eel, &c. "Sugar," says the author of "Diet and Digestion," "seems to be the first support of vegetable life, and it is well known to be the principal food of young animals. It perhaps yields more chyle than any other constituent of plants." Sugar, like common salt, is useful after excess in eating. It precipitates digestion, particularly with or after fruits; it excites the secretions of the digestive organs, and is good for old and inactive stomachs. There are many successful examples of aged persons taking it as their principal food during many years. Dr. Rush entertained a high opinion of its dietetical qualities.

But, in proportion as sugar is wholesome, alcohol, which is made from the same principle in plants, is deleterious. The solid and nutritious part of milk is sugar; but, when fermented and distilled, it becomes one of the most inflaming of ardent spirits, i. e. *burning* spirits.

The origin of the excessive importation of molasses into this country, and of the excessive use of distilled spirits resulting from that importation, are among the most instructive matters in our history.

It is but little more than a century since that importation began. In the French West Indies the sugar manufacturers used to throw away their molasses, as indeed they did at first in Jamaica, and as they do to this day in the islands of Bourbon and Java. The New-Englanders, particularly in and about Boston, taking note of this circumstance, induced the French, for a trifling consideration, to preserve this residuum, and deliver it on board the colonial traders. Arrived at Boston and other ports, the adventurers entered the article free of duty, and it was then converted into New England rum. In a few years, the business so enlarged itself, that the trade was extended to the Dutch and Danish colonies. In exchange, our people gave to the Frenchmen and others, horses and mules to work their sugar mills, lumber for their houses, and fish and other provisions for the plantations. In 1715, a few years after the commencement of this traffic, the British island colonies complained of it to the government, as diminishing the demand for their products, and disappointing them of their wonted supplies. Here upon a fierce and protracted contest arose betwixt the island andcontinental colonies, which was not terminated until 1733, when the islands prevailed, and a duty of 6*d*. a gallon was laid on molasses, and 5*s*. per cwt. on sugars, imported into the continental colonies from any foreign port or place. The penality for violating the act was to be the forfeiture of vessel and cargo. But the New-Englanders, who had disputed every inch of the passage of the act, seem never to have thought of submitting to it after it was passed; and they continued the old traffic, eluding the duties and defying the law. A British fleet was sent to enforce it, and a state of irritation arose, in which the parties all but came to blows. In fact, this did never cease, from that time down to the revolution; and the famous act for raising a revenue in America was called, in the language of the day, "the sugar and molasses act."

The principal reasons alledged for the trade were that a large supply of rum was indispensable to the continental colonists for carrying on the Indian trade and the fisheries. These reasons have ceased. Rum has nearly finished its mission to the poor Indians; and the fishermen, we believe, generally go upon the temperance plan. The real root of the matter was, and is, that no other people, since the world began, were ever furnished with so great a quantity of exciting liquor for so small a price. The custom house duties, in other countries, either kept out molasses and rum, or admitted them with so heavy conditions, that they could not be afford-

ed in such abundance as they have been here. Ardent spirits were unknown, except as a medicine in the druggist's shop, until the cane sugar and molasses makers of the West Indies brought rum into the world. The taste once formed, demand arose for brandy, perry, gin and whiskey. Anderston, in his 'Origin of Commerce,' remarks: "The consumption of rum in New England is so great, that an author on this subject asserts, that there has been 20,000 hhds. of French *molasses* manufactured into rum at Boston in one year, so vast is the demand for that liquor." Sir William Douglass, in a work printed at Boston, in 1755, tells us, that "spirits, (spiritus ardentes.) not above a century ago, were used only as officinal cordials, but now are become an endemical plague, being a pernicious ingredient in most of our beverages."

The duty of two cents on brown sugar, in the United States, was originally laid for revenue, though it must be considered high for that purpose; being nearly fifty per cent. on the cost. At the time of the purchase of Louisiana, it was advanced to two and a half cents, propably for protection. During the last war with great Britain, it was doubled, being then five cents. At the peace it was fixed at three cents, avowdedly for protection. In 1832, it was brought back to the rate of two and a half cents; and this is maintained for the encouragement of the sugar planters of Louisiana, Florida, Arkansas, Mississippi, Alabama and Georgia. The article is afforded in the New Orleans market, and on the Louisiana plantations, at five to six cents a pound. The planters have repeatedly declared, that, at less prices, the business cannot be sustained. The cost of production, when this industry was most flourishing, was two and a half to three and a half cents, exclusive of the interest on the investment.

We have now surveyed the field of competition in which the beet sugar business must take root, if that be its destiny in this country. It is certain, that the high hopes conceived of it have suffered considerable abatement from experiments made, and views put forth, in Great Britain. These it is our duty to weigh, and to determine how far they ought to influence the resolutions of North American cultivators and capitalists. But it is necessary that we should first examine, with some minuteness, the history and present condition of beet sugar industry.

It is now nearly a hundred years since Margraff, a Prussian chemist, residing at Berlin, made the discovery that the beet contained a good crystallizable sugar. His attention was first drawn to this subject by the saccharine taste of the beet, and the crystalline appearance of its flesh, when examined with a microscope. Having cut the beet into thin slices, he dried perfectly, and then pulverized them. To eight ounces of the powder he added twelve of highly rectified spirits of wine, and exposed the mixture to a gentle heat in a sand bath. As soon as the liquid reached the boiling point, he removed it from the fire, and filtered it into a flask, which he corked up and left to itself. In a few weeks he perceived that crystals were formed, which exhibited all the physical and chemical properties of the sugar cane's. The alcohol still contained sugar in solution, and a resinous matter, which he disengaged by evaporation. Having submitted several other vegetable substances (as parsnips, skerret, and dried grapes) to the same treatment, he obtained sugar from each. In 1747, he addressed to the Academy of Berlin a memoir, entitled 'Chemical Experiments, made with a view to extract genuine sugar from several Plants which grow in these countries.'

Margraff solved the important problem, that genuine sugar was not confined to the cane. After this, he enlarged and varied his experiments, but did not invent means of making sugar from the new material on a scale sufficiently large to render it an object of interest to capitalists. Yet he seems to have had a prescience, that his discovery would one day assume importance. He commended it to the attention of the Prussian cultivators, and particularly the small farmers, as offering a new and beneficial branch of agriculture.

Margraff died in 1782. He was a member of the Academy of Berlin, Director of the Class of Natural Philosophy, and Fellow of the Academy of Sciences at Paris. His works were collected and published in two volumes, octavo, in French, 1767. A German translation was published at Leipsic, the following year.

It was Achard, also a chemist of Berlin, who discovered the method of extracting the sugar from the beet on a large scale, and at a moderate expense. He first announced this result in 1797. In 1799, a letter from him was inserted in the *Annales de Chimie*, in which he detailed his method. He there states the cost at 4¾ cts., the pound of Silesia,—or about 6 cents the pound avoirdupois,—without counting the benefit to be derived from the residuums. He also expressed the opinion, that, with these included, and with some improvements in the processes, this sugar might be produced at half that price. This announcement caused a great sensation in France. It engrossed the attention of the Parisian world; eliciting, alternately, ridicule and admiration. The high price to which sugar had risen in France, in consequence of the capture of nearly all her colonial possessions, gave something more than a speculative interest to the ideas of Achard. The National Institute appointed a commission to examine the subject. The result of their investigation was, that the cost of raw sugar of the beet would be 16 cents per pound. The price of sugar was such, that even at that rate a very large profit might have been cleared; but this consideration was not sufficient to induce many persons to take the risk of a peace with England, supposed at that time to be approaching. Only two establishments were formed; one at St. Ouen, and the other at Chelles, in the environs of Paris. Both of them were failures; partly from the bad quality of their beets, and partly from the ignorance and inexperience of the conductors and workmen. With them went down the high hopes, which had arisen, of this new branch of industry in France.

It is difficult to say, whether these hopes would ever have been resuscitated, if political events of an overruling nature had not supervened. By the Berlin and Milan decrees, all colonial articles were prohibited, and that famous "continental system," so wide and wild in its design, but so important and permanent in its effects, was established. From that time, 1906, chemists and economists applied themselves with renewed zeal to the search after an indigenous source for the supply of sugar. It was thought, at one time, that the desideratum

had been attained in the production of grape sugar, or sirup; of which, in the course of two years, many million pounds were made. This sugar, although very abundant in some varieties of the grape, raised in a southern latitude, possesses only two-fifths of the sweetening power of the cane and beet sugar. Nevertheless, sugar being at about one dollar a pound, a great number of manufactories were erected, and science and industry were tasked to the utmost, to improve the processes, and to bring it to perfect sugar.

In this state of things, it was announced, that beet sugar manufactories had been all along carried on successfully in Prussia, It was declared, that from 4 to 6 per cent. of sugar was obtained from the beet, besides several other valuable matters. Other German chemists had insituted experiments, and published results substantially the same as Achard's. At length in 1809-10, experiments were recommenced in France, particularly by M. Deyeux of the Institute, who had reported upon the subject in 1800. The experiments resulted in the production of a considerable quantity of sugar, both clayed and refined, which, as specimens, served to revive and increase the confidence of France in this source of supply. No more than 1 to 2 per cent. was obtained; the beets being of a bad sort, and raised in the neighborhood of Paris, where a vast deal of ammoniacal manure, hostile to the production of saccharine, is used.

In 1811, M. Drappier, of Lille, worked about fifteen tons of beets, from which he obtained 2½ per cent. of sugar. In the winter of the same year, an experimenter at Paris succeeded in obtaining 4½ per cent. from white beets, raised at a considerable distance from Paris, and without any manure. This was the first essay in France which approximated to the results of Achard. It was made by M. Charles Durosne, and was detailed in the *Moniteur*, It demonstrated how faulty had been their selection of sorts, and the mode of culture. At this time, Achard had published in German an extensive work, in which he had treated with minuteness every department of the business, from the raising of the seed to the refining of the sugar. This treatise contained not only Achard's experience of thirteen years, but also accounts of the manufacture of beet sugar, on a grand scale, by other persons in Prussia. The result of these enterprises, as reported by a commission appointed by the Prussian government to investigate the subject, was, that in the case presented to their consideration, 60,800 lbs. of sugar were manufactured from 1,000,000 lbs. of beets, which is 6 pounds 1¼ oz. per cent., costing for cultivation and manufacture, 6.6 cents a pound, and selling at 16.17 cents. The profit was stated at 136 per cent., without reckoning 27,883 gallons of vinegar, worth $1,987 25; 155,400 lbs. of feed for beasts, worth $97 16; and after deducing $1,382 25, for the greater supposed expense of refining beet sugar. This, however, has since been recognized as an error; beet sugar being in fact the most profitable to the refiner, by reason of the superior strength of the grain, and of the deterioration which the cane sugar undergoes by fermentation and decomposition during long voyages and storages, before it reaches the pans of the refiners. This loss is estimated, in France, at 14 per ct. on East India sugar, and at 7 on West India.—The British custom house allows 1 per cent. a month for the waste on bonded sugar.

Such was the result of the operations in the manufactory of the Baron de Koppy at Krayn, near Strehlen in Silesia.

Another course of experiments was instituted by Dr. Neubeck, the royal commissioner, who obtained the following result, working upon a material of one million of kilogrammes.

Sugar, 101, 472 kilg.'s at 16.72 cts. a pound,	$16,985.05
Spirits of wine and vinegar, made from the molasses and pulp,	8,083·38
Mash used for feeding and fattening animals,	189·53
Total.	$25,257·96
Expense,	7,892·28
Net profit,	$17,365·68

Mr. Achard's sugar according to the report of Dr. Neubeck, cost 7.7 cents a pound, and yielded at 16.72 cents, the price of sale, a profit of 8.92 cents a pound. Their beets yielded 4.6 per cent. of sugar.

The experiment at Lille (M. Drappier's) was less successful. He obtained only 1.3 per ct. of refined sugar; and, although this merchandize was then at 35 cents a pound, this price hardly covered the expenses of production, without, however, counting the residuums.

In January, 1812, Napoleon, issued a decree establishing five chemical schools for teaching the processes of beet sugar making, detailing one hundred students from the schools of medicine, pharmacy, and chemestry, to be instructed in those establishments, and creating four imperial manufactories, capable of making 4,408,000 lbs. annually. Munificent premiums were also decreed to several individuals, who had already distinguished themselves by a successful application to this new branch of industry. A considerable number of manufactories were immediately added to those already existing in France; and, in the season of 1813, a large quantity of sugar, both raw and refined, was produced. A notable improvement was introduced by M. Mathieu de Dombasle, a learned and experienced cultivator and chemist. It consisted in applying to the beet juice the colonial process of depuration appropriately called in France *defecation*. This was in fact very analogous to the improvement which the Arabs affected in the oriental method. Achard used sulphuric acid in this operation, and for the crystallization, broad dishes, not unlike those said to be used in China at this day. The colonial process of defecation by lime is now nearly universal in France, as is likewise the substitution of the mould or conical pot, for the crystallizers of Achard.

Such was the prosperous condition of this manufacture, when the disasters of Moscow brought upon it an uncertain political future, the bane of all great industrial enterprises. Confidence and energy gradually yielded to fear and discouragement. A faint and fitful struggle was maintained during another year, until the Cossacks, quartered in the sugar mills, and the allied artillery, seizing upon the beasts that moved them, gave the manufacturers the *coup de grace*. The officers billeted at their houses became from curiosity their principal customers, being struck with the brilliancy and purity of this unexpected product. After the final overthrow of Napolean at Waterloo, the price of refined sugar

settled down at 12 cents a pound, and raw at 7. Still, to the surprise of all, two beet sugar manufactories did survive the shock of this tremendous reverse, more useful to this industry, and to mankind, than all its preceeding prosperity; because it demonstrated, what never could have been done under the unnatural stimulus of the "continental system," that there was an intrinsic value in the new industry, rendering it capable of independent existence, and raising it out of the reach of accident, political enmity, or caprice. The establishments which survived were at Arras, in the Department of the Pas de Calais, and at Pont a Mousson, near Nancy, in the Department of the Meurthe.

After the retirement of the allied troops, in 1818, the government began to turn its attention to the encouragement of an industry, which had struggled meritoriously and successfully to preserve a boon to the French nation. Many eminent and public spirited citizens raised up establishments, more perhaps to give the benfit of experiments to their countrymen, than with a view to profitable investment. Men of genius aud profound research occupied themselves with elaborate experiments, and published their results. Among the most important were the Count Chaptal, who detailed, in Memoirs, on the subject, and in his 'Agricultural Chemistry,' the experience of many years as a cultivator of beets and manufacturer of sugar; and M. Dombasle, who did the same, with admirable clearness and precision, in his work entitled 'Facts and Observations relating to the Manufacture of Beet Sugar.' The latter, with a prospect of many more years of usefulness, is still at the farm school at Roville, near Luneville, in Lorraine, devoted to agricultural and chemical studies, and imparting the results of his long experience, fertile genius, and assiduous application, through his publicaiions which go to all parts of the world, and to pupils who come from every nation. As an intelligent and industrious operative, M. Crespel Delisse, of Arras, is worthy of honorable mention This gentleman was originally a laborer. He became the foreman of the first beet sugar manufactory at Arras. The proprietor, who had invested an immense capital, sank in the general wreck of 1814-15. M. Crespel suceeded him, with the great advantage of having his fixtures at about one-fourth of their real value. This was one of the two establishments which survived, and it continues to this day to be one of the most extensive and successful in France. M. Crespel is interested as part or sole proprietor in seven or eight other farms and factories. He has received the gold medal of the Society for the Encouragement of Agriculture, at Paris, and the honors of knighthood from the French and other European sovereigns.

The method in general use in France is to crush, or grind, the beet with an instrument called a *rasp*, though its functions would be better described by the word *grater*. It is cylindrical, and revolves four hundred or more times in a minute. This reduces the beets to a very fine pulp. They are then pressed in hydraulic presses of great power and the juice defecated, evaporated, boiled, and filtered, in very much the same manner as the cane-juice in the colonies. The great difference is, that the beet sugar machinery has been rapidly improved, and the cane planters have begun to avail themselves of the improvements. There is, however, another method of extracting the saccharine, which dispenses altogether with grating and pressing. This is called *maceration*. It was first proposed by Dombasle, and has been tried in various forms with more or less success. M. Martin de Roclincourt, originally a captain of engineers, is the inventor of an ingenious and valuable machine for performing this operation. The beet is first cut into ribands, about one line in thicknees. They are then plunged into boiling water, which is admitted into the machine at regular intervals, in regular doses. The ribands remain passing through the circuit of the machine during one hour, and steam is occasionally admitted to keep up the heat. In this time, the sugar contained in the ribands is dissolved, and remains in solution in the water, while the ribands, now called pulp, are discharged on the side of the machine opposite to that where they entered it; the liquor containing the saccharine, flows off in another direction to the defecating pans.

This method is employed to a considerable extent in France, but by no means so generally as the rasp and the press. Its advantages are, that it gives rather more and a rather better product, and requires a great deal less labor. Its disadvantages are, that it takes a great deal more fuel, and does not leave the pulp in so good a state for feeding; there being too much water in it, and less saccharine, than in that which comes from the press. It might be subjected to pressure, by which a little additional liquor would be obtained for the pans, and the pulp made vastly better for feeding. This, however, would require so much power of the press, and so much pains, that the French generally feed with the pulp just as it falls from the machine. We have little hesitation in giving the preference to this method in a country where fuel is cheap and labor dear. The immense establishment commenced in London two years ago, but abandoned in consequence of the excise of 4¾ cents a pound, which the government hastened to impose in order to guard the West India interest, was upon this system. On the other hand, the only other beet sugar manufactory, upon a scals of any importance, in Great Britain and Ireland, which is near Dubilin, has adopted the rasp and press. The former establishment delivered for consumption a considerable quantity of refined sugar, which was so completely undistinguishable from refined cane sugar, that the government issued an extraordinary notice, that any fraud in the exportation of it with the benefit of drawback would, if detected, be punished with the utmost severity. Whether the establishment in Ireland still exists, we are not informed. It is, however, the opinion of persons skilled in the manufacture and refining of sugar, and who have had small experimental beet sugar factories near London, that the business cannot be sustained under a duty of 4½ cents. Others are confident, that, in consequence of the application of the fibre to paper making, by which the value of the pulp is enhanced fourfold, the business will yet get a permanent footing in Great Britain. We do not think a fair experiment has yet been made in that country. The original prejudice against the pretensions of the new manufacture, forced forward by the odious machinery of the "continental system" and the power of the empire, to become a rival of their colonial industry, was of course virulent and obstinate. That

it still abides in the mass of the British nation, and in minds which ought to be above it, is apparent from some limited and rather dogmatical views contained in No. CXXXI. of the 'Edinburgh Review.'

The protection of the beet sugar culture in France, and in other nations on the continent, is very high, as we have seen: much higher than protection of any article of general and necessary use ought ever to be. It is at least a hundred per cent. on the cost. But we have also seen, that this business did not succumb to the shock and disappointment occasioned by the fall from a protection of three hundred per cent. to no protection at all. After the general peace, sugar fell as low in France as it is in free ports of Europe at this time. An immense stock had accumulated in the sugar colonies, which had been successively captured, and were in the hands of the British, insomuch that they actually fed horses and other animals upon sugar. Yet, at that very moment, the working classes of Great Britain, under the onerous duty of 6 cents a pound, were drinking their coffee without sugar, as indeed they continue to do, to a great extent, to this day. This is to give a monopoly of the market to the West India planters. Here is folly and extravagance of taxation and protection, which quite eclipse the French beet sugar policy. The Edinburgh reviewer, states, that "the great *impetus* given to it was in 1806." Now, in truth, the beet sugar manufacture *did not exist in France* at that time, nor until four years after, and not then to an extent worth naming. No "impetus" was given to it until the experiments of 1811, and the decrees of the emperor awarding premiums, and establishing schools and model factories, in 1812. Again he asserts, that "in two or three years more, France will be fleeced of £2,600,000 per annum, for the benefit of the landowners of *Alsace*." Such allusions, however slight in themselves, tend to gain the confidence of the reader in the minuteness and accuracy of a writer's knowledge. But Alsace is not a seat of this manufacture; comprising two departments, the Upper and Lower Rhine, it has but five sugar manufactories, while the Department du Nord has two hundred and twenty-six, and the Pas-de-Calais, one hundred and thirty-eight. These errors show, that the writer had not examined the history and present state of the beet sugar business in France, and was not therefore fully competent to pronounce an opinon upon it. His essential error lies in not taking into view the fact, with which he was probably unacquainted, that it has already encountered and survived that test of its utility, which he himself proposes, and before which he says it "would quickly disappear," viz: a free competition with colonial and foreign sugar, and an extreme depression of price.

The condemnation of beet sugar, in the eye of the Scottish economist, is, that it has received protection. Tried by the same rule, what must be the fate of West India sugar, or of any great branch of British industry? Or of the Louisiana cane planters, or of the American cotton and woollen manufacturers, coal miners, salt makers, hat makers, tailors, and shoe makers? The article is, in fact, a dash at *tariffs*. That battle we at present decline, referring the assailant to an abler antagonist in the same journal, about eight years back.

It does not appear, that our contemporary had examined any of the French works upon his subject, except a couple of pamphlets by a merchant of Havre, who was probably interested in the colonial sugar trade, which, when beet sugar arose, was enjoying an absolute monopoly of the kingdom. The beet sugar has reduced the price of sugar in France 25 per cent., and has of course much increased the consumption of the article. The first of these facts is not noticed, and the second is denied. We have often heard the French manufacturers regret, that competition has reduced the price of sugar, since their establishments commenced, from 15 to 10 *sous* the pound; and it appears by the report in the Chamber of Deputies, prefixed to his article, that the sales at Paris alone, from October 1st, 1835, to September 30th, 1336, increased 17,000,000 lbs. But the French Chambers, in 1837, laid a duty on indigenous sugar, which will amount, expenses of collection included, to 1.7 cents a pound. Of course, this leaves the protection in France at 2.55 cents; no more than that which the cane sugar planters of the United States enjoy, and not so much by 6 cents a pound as the British discriminating duty in favor of her sugar colonies!

Will the beet sugar manufacturers of France be able to sustain themselves under this change of policy? This is a question which experience must decide. Undoubtedly, the legislature firmly believed that they would, or they would not have imposed the duty; for the French no more think of sacrificing this interest at home to the colonies, or to any other object, than they think of removing Paris to the island of Martinique. Many of the manufacturers will succumb, because it is a law of political economy, that if a business is better than ordinary, it will cause a proportional rush of competitors to it, a part of whom will adventure without adequate skill and capital, trusting to the goodness of the business to make up for these deficiencies.

The culture and manufacture of beet sugar in France, according to the result of ten cases, which we have examined, has yielded of late years an average profit of 49½ per cent. on capital. In some of these cases the profit was as low as 9, and in others as high as 90, per cent. Now, as the duty of 1.7 cents amounts to a reduction of 22 per cent. on the former rate of profit, it follows, of course, that all those establishments, which, on the scale of profit are below 22 per cent., must go down, unless sustained at an annual loss. Even many of those which would range on that scale above 20 per cent., but which have proceeded principally or wholly (which is not often the case in France) on borrowed capital, trusting to larger profits for the means of extinguishing the original debt, will doubtless fail. The probable number of failures in consequence of the law, was estimated at two hundred, out of a total of five hundred and fifty establishments. Others will probably remove from France, and set up in Belgium, Germany, Russia, or Austria, where protection is greater, and, what is more material, stabler; for those countries have no colonial interest to consult. Opinion is, however, that the law will undergo some modification before it shall have produced this last consequence. These failures or removals, if they shall take place, will not show what protection, or whether any protection is really needed. They will be the natural

result of subtracting from a business a protection which it had been accustomed to have, and on which it relied.

But let us consider a moment what are the conditions, under which a manufactory is to go on in France, if the tax shall stand. According to the results of the working of twenty-nine French factories, situated in every variety of locality, the average cost of the production of beet sugar in France is 6.6 cents per pound. The lowest rate, which we find, is 5.9 cents; the highest 8.6 cents per pound. But, in these results, the pulp and molasses are the only accessory products taken into the accounts; and these, only at low venal values, which are not more than from one-third to one-half of what they are really worth, when used with judgment and economy on the spot, without the cost and uncertainty of procuring them from a distance. But there are other accessory benefits, very important in rural economy, which are left out of sight in these accounts. These accessory benefits are:

1. The leaves, which constitute an excellent green feed, which may be used as such from August to November, two or three months; or they may be dried and laid in for winter. They are worth five dollars an acre.

2. The manure, which is found to be increased from three to four-fold on farms where sugar is manufactured. This manure coming from the stables, or from the scums and deposites of the defecating pans, or from the bone-black, which is much used, is of the very best quality, and a portion of it acts upon vegetation with a promptness and energy truly extraordinary.

3. The trimmings of the beets, preparatory to their being submitted to the washing machine. These consist of the decayed parts of the beets, and the forked and fibrous roots, which are cut from them in the process of relieving them from adhesive earths, with which, in most kinds of soil, they will be more or less loaded. Chaptal considers the daily trimmings of 12,000 lbs. of beets sufficient to feed from twenty five to thirty swine, during the manufacturing season. The quantity of beets worked up in the French factories, is rarely less than 20,000 lbs. per day; it is in some more than 100,000 lbs. Many manufacturers merely transport the trimmings to the fields, there to decay, and serve, to some extent, as manure.

4. The ashes coming from the furnaces.—These are valuable, whether sold to the soap boiler, scattered upon the fields, or cast into the farm yard.

It will be readily perceived, that these items are important, and some of them all important to farmers.

M. Dombasle estimates the pulp, and molasses if the first be used by the proprietor, for feeding and fattening cattle, and the second for distillation, as worth 35 per cent. of the whole expenses of a sugar establishment; but he leaves out the four items which we have enumerated above. We doubt not that those are worth to the cultivator as much more; making 70 per cent. of the costs of producing the sugar defrayed by the accessory and agricultural benefits. Let us listen for a moment to M. Crespel Delisee, who thus testifies, February, 1827, before a Committee of the Chamber of Deputies:

"The culture of the beet has increased remarkably the value of real estate. He lately purchased at the rate of $152 an acre, some lands which were let at $3.80 an acre. Since they have been cultivated with the beet in the rotation of crops, the number of sheep thereon has been doubled, and the horn cattle trebled. In a few years the value of the farm will have increased 50 per cent.

"The rents of leasehold property have been doubled where the land was of a medium quality; and, in case of lands specially adapted to the beet, the rents had been quadrupled."

M. Spineux, another cultivator and manufacturer, belonging to the department of the Somme, tells the same committee, that, "when he took possession of his farm of 350 acres, he believed that it gave a profit of $853. On annexing a sugar establishment, he obtained a profit of $1,425."

M. Chinchain, of the department of the Sarthe, testified as follows:—

"He cultivated about 1100 acres, 550 in beets. He procured one hundred bullocks from Poitou, which he fed with pulp and a little straw. His neighbors, struck with the advantages of his cultivation, came and offered to weed his beets for the weeds; and to dig, clean, and cart them, for the tops. This practice has had the effect of diffusing so much plenty around him, that during the beet harvest, butter falls in price at Angiers, four miles from his factory."

It is the general testimony in the neighborhood of Dunkerque, Valenciennes, and Arras, that real estate has risen 50 per cent. in consequence of the introduction of the beet sugar culture, and wages in nearly the same proportion.

Let not this statement be passed heedlessly by. An advance of 50 per cent. on the value of farms will soon change the face of a country. Land worth $20, becomes worth $30; and land worth $50, becomes worth $75. It is the same as if money should spontaneously increase in quantity, so as to give the lender, at the end of a few years, a principal of $150 for $100, after having yielded him his annual interest.

It has been said, that the opening of the Erie canal had the same effect upon the real estate in the central and western counties of New York. The beet sugar culture is better, because it is at the option of every cultivator of enterprise and industry, whether he will have it or not. It is what the canal would be, if every farmer could by his individual exertions bring it by his own door.

Another important view of the beet sugar culture is, the benefit which it confers upon the soil, by clearing, dividing, and fertilizing it. It fallows without exhausting, and is one of the best preparations for wheat and other grain crops. In a country like France, where seventeen millions of acres, one-fourth of the arable land, lie fallow all the time, the use of this culture, as a substitute for fallows, is a matter of no slight importance.

To consider, then, the beet sugar business merely in its manufacturing aspect, leaving out all these rich results, or to bring as an argument against it some derangement of commerce and revenue, which will of course result from any considerable change, be it beneficial or otherwise, is to entertain a contracted and deceptive view of the subject. We readily concede that, considered as a manufacturing business, without giving any additional agricultural profits, or connecting itself with any agricultural improvement, it is not yet

proved that it would be profitable, but that it is highly so, when the manufacture is made subsidiary to agriculture, and fills up the inactive season of the northern winter, we confidently believe, and do not expect any intelligent man to deny. Suppose, however, it should be found, that the pulp is worth, for paper making, five times its value as food for animals; or that the processes and machinery of the manufacture should be so perfected, that the *ten* or *ten and a half* per cent. of saccharine matter, known to exist in the beet, should be extracted and crystallized? In either of these cases, beet sugar making would be very profitable, as a purely manufacturing concern. Now we feel authorized to say, that neither of these improvements is any longer hypothetical. In England, Mr. Kyan, the inventor of the method of preserving timber from the ravages of the dry rot, has obtained a patent for making paper of beet roots, after the juice is expressed. We have seen several specimens of a firm and durable wrapping paper, made of this new material. We are informed, that good printing paper has been made principally of the same substance; and it is confidently expected, that fine writing paper will be produced. The extensive and increasing demand for paper, and the immense commerce now carried on in rags, are sufficient proof of the importance of this application of the beet root pulp.

It is well known to those who have attended to the progress of this business in France, that the profits of the principal manufacturers have been much absorbed by a desire, probably too earnest, to keep up with the improvements of machinery. Much has likewise been lost in unproductive experiments. It would be ungrateful and ungracious to find fault with our French friends on this account; since they have carried the business through the natural and necessary period of infancy, at their exclusive cost, for the common benefit of mankind. They have all along been conscious, that they were obtaining from the beet but little more than half its saccharine matter. This conviction has naturally and very properly caused a restlessness, and a striving after something more perfect. It is certain, that those who have resisted all innovation, and adhered to the original methods and machinery, have been the most successful; but, if all had been equally cautious, little improvement would have been made, and the nation and mankind would have been at a remoter period, and in a less degree, benefited. Nevertheless, we fully believe, that the cotton manufactory has never been established in any country with so few failures, and so little loss and fluctuation, as the beet sugar business in France, and other countries of the continent.

But we now safely assert, that the great desideratum which the French manufacturers of beet sugar have always felt, and have been striving to supply, is at length attained; that a method has been discovered by which the beet is deprived of all its saccharine, be the same more or less, and that this matter is obtained and operated upon in such a manner as to be nearly all in a crystallizable state. Hitherto, about 50 per cent. of the saccharine has resulted in molasses. This residuum is of comparatively small value; and every thing which arrests the formation of it, adds by so much to the deposite of sugar, and to the profits of the proprietors.

Mr. Schuzenbach, a chemist of Carlsruhe, in the Grand Duchy of Baden, is the author of this improvement. Having obtained his result in the laboratory, he communicated it to distinguished capitalists in Baden, who thereupon formed a company; not with the view, in the first instance, of erecting a manufactory upon the new system, but merely of proving its pretensions. To this end, they advanced a considerable sum for setting up experimental works so large, that the thing could be tried on a manufacturing scale. Having done this at Ettingen, near Carlsruhe, they appointed a scientific and practical commission to follow closely the experiments which Mr. Schuzenbach should make. Commissioners from the governments of Wurtemburg and Bavaria likewise attended. The experiments were carried on during five or six weeks, in which time several thousand pounds of sugar, of superior grain and purity, were produced.

The Baden company were so well satisfied with the report of the commission, that they immediately determined to erect an immense establishment, at an expense of more than $200,000 for fixtures only. A like sum was devoted to the current expenses of the work. Factories were simultaneously erected at or near Munich, Stuttgard, and Berlin. The arrangements were made with remarkable intelligence and caution; and we cannot doubt, that the new method will prove of immense importance to the prosperity, comfort, and improvement of the northern nations and colonies of the old world and the new.

DUTCH BUTTER.

From the Genesee Farmer.

Large quantities of butter are annually imported into England from Holland, and some from the same country has occasionally found its way into this. It is justly celebrated for its superior quality, and its power of resisting decomposition, or its not being liable to become rancid. In the Holland dairies, every thing is conducted with a system and neatness, from the feeding of the cows to the completion of the butter, worthy of all imitation and praise. That there is any thing in the climate or pastures of Holland that renders their dairy products superior to those of the rest of Europe, or to ours, is not to be supposed; the difference is clearly in the manipulation, and were our butter and cheese in general, made with as much skill and care as in Holland, we might successfully compete with the Dutch in the West Indies and other markets, to which our butter will now barely pay the cost of transportation. According to the report of Mr. Mitchell, made to the Highland Society of Scotland, the process in the Dutch dairies is substantially as follows:—The milk, when taken from the cow, is poured into large earthen pitchers and placed in a vat of cold water, which quickly reduces the temperature. It is then placed on shelves until the cream separates, when it is taken off and placed in vessels for churning. In these it is first allowed to become a little soured, and then the churn is half filled with the cream. In the best dairies, churning is performed daily; the system being so arranged, that a supply is constantly in readiness. In winter, a little boiled water is added to the cream to give the proper temperature previous to churning; and

in very warm weather, it is sometimes submitted to the cold bath to reduce the heat. The butter, when taken from the churn, is put in a shallow vessel and carefully washed with pure cold water, and then worked with a slight sprinkling of fine salt, whether intended for rolls, or for barreling. The butter is considered best, when the cows have been at grass about three weeks; it is then delicious —is made into fanciful forms of animals, pyramids, &c., and stuck over with fragrant flowers, and sells as high as sixteen or seventeen cents per pound. When intended for packing, the butter is worked up twice or thrice a day, with soft, fine salt, for three days, in a shallow tub; there being about two pounds of this salt used for fourteen pounds of butter. After this thorough preparatory working, the butter is then hard packed in thin layers into casks made perfectly sweet and clean. The wood preferred is oak, smoothed carefully inside. Three or four days before they are used, the casks are filled with sour whey, and this stands until they are emptied and cleansed for the packing of the butter. It is clear, from this description, that independent of the perfect neatness observed in every part of the process, the excellence of the Dutch butter, and the ease with which it is kept in its original sweetness when packed, is owing to the manner in which it is freed from the least particle of buttermilk, by the first washing and the subsequent repeated workings, as well as to the perfect incorporation of the salt by the same process. There are many of our American dairies that produce superior butter; but as a whole, that in our markets is a miserable article, destitute of that rich flavor belonging to good butter, and owing to the great amount of buttermilk left in it, utterly unfit for keeping. We believe a reform in these respects, would add materially to the profit of all those who should attempt it, as well as add greatly to the comfort of the great mass of purchasers and consumers.

MILK SICKNESS.

From the Genesee Farmer.

A gentleman at the west has announced, that he has discovered the cause and the cure of this formidable disease, which has been so destructive in some parts of the western states, and has, in some few instances, destroyed or driven the inhabitants from some of the most fertile sections of the country. He is claiming considerable sums from the state legislatures for the promulgation of his specific, and should there be no humbuggery about it, he will certainly be entitled to a handsome reward, in those states where the losses from this cause have already been so great.

There are no traces of a similar disease in any other part of the world; and in the United States it has been principally confined to Tennessee, Kentucky, Ohio, Indiana and Illinois, though it is believed some few instances have occurred in Wisconsin, and west of the Mississippi. A multitude of speculations have been made as to the probable cause of this fatal complaint, both among medical men and others; and there is scarcely a poisonous mineral or plant to which it has not in turn been attributed. Public opinion at the west seems to have settled on the opinion, that it was produced by a low shrub or vine assuming at times the form of a climber, and bearing bunches of brown berries. Whatever the poison may be, it causes cattle to quiver, stagger, and die within a few hours. If cows eat of it, the milk is poisoned, the butter is also poisoned, and those who partake of either, are as surely injured, as if they had partaken of the original cause itself. The slightest symptoms are vomiting, and this more severe as the quantity of poison is greater, until violent spasms and death ensues. Dogs and wolves who feed on animals that have died with this disease, share the same fate; and to prevent the extending of the evil to dogs and swine, cattle that die with the poison are buried carefully to avoid such results.

In districts where the disease prevails, great care is necessary in killing beef animals, as sometimes the beef will produce vomiting, when the animal is so little effected as to escape notice. To test the presence of the disease, some butchers are in the habit of driving the animal a mile to heat its blood; when if it is poisoned it will exhibit that peculiar trembling so certainly indicative of the presence of the complaint.

In remarking on the formidable nature of this complaint, a writer from the west says,—

"I have seen many farms with comfortable buildings and improvements, entirely abandoned, and their owners fled to other quarters, to avoid this dreadful curse."

But perhaps the most signal instance of its fatality is given in the following extract of a paper from Col. Hinde of Illinois, who has given much attention to the topic:

"Calling to see a friend on Darby Creek, Ohio, whom I had not seen for twenty years, he pointed to his wife and remarked—'she is my third wife; I am her third husband; and in yon grave yard lie fifteen members of our families taken off by that dreadful disease, the puking complaint."

Surely there must be some unusual fascinations in any place that would lead an individual for so many years to encounter so fatal an enemy to life. Should the announcement of the discovery alluded to, prove well founded, it will be a valuable boon to the west, and save annually great numbers of cattle and many valuable lives.

NATHANIEL BACON. REPLY TO STRICTURES.

To the Editor of the Farmers' Register.

Two papers appeared in your July number, dated at Williamsburg, one entitled 'Reminiscences of James Town,' the other 'Bacon's Rebellion,' which latter commences as follows: "An article under this head, published in the Petersburg Intelligencer, states that Nathaniel Bacon (called the rebel) was a member of the council. I doubt it. Where is the evidence?" Having, I believe, contributed that article to the journal mentioned, I think, it may be worth while, to make some inquiry into the grounds on which the statement objected to rests. And as among other authorities, I shall rely upon the Stafford manuscript,*

* This *manuscript* may be found published in Kercheval's Hist. of the Valley of Virginia, Introduc. p. xx., Rich. Enq. vol. 1. nos. 34, 5, 6 & 7, and in Lit. and Evang. Mag., vol. 3. p. 130.

it will be proper first to advert to another portion of the article of your Williamsburg contributor, where he undertakes to discredit to a certain degree, the authority of that manuscript. "This account [the Stafford manuscript of T. M.] may be substantially true, but it certainly contains many errors. It states that Bacon was unanimously chosen a member, and was taken prisoner on his way to that assembly; that he saw him in his seat as a councillor, when the assembly was in session, of which he was a member. There is no instance of a man's being both burgess and councillor at the same time."

The following words related by T. M. author of the Stafford manuscript, as spoken by Lawrence to him, seem to evince clearly, that T. M. did by no means intend to convey the idea, that Bacon was both burgess and councillor at the same time. "Forasmuch as the taking Mr. Bacon again into the councill, was first *to keep him out of the assembly*," &c.

But even admitting that T. M. had stated it, (which it seems manifest that he has not) yet it is not absolutely certain, but that such a statement might have been true, for I find the following resolution:

"May 1st, 1652.

"Whether the governour and council shall be members of this assembly or no; generally voted, *they shall be*, taking the oath the burgesses take." Rand. M. S., Jef. M. S., Hen. Stat., vol. i. p. 373.

Your Williamsburg correspondent proceeds: "It also states, that Sir William Berkley issued a proclamation against Bacon, *prior* to the 5th of June, 1676, when Bacon went down to take his seat in that assembly," and concludes that "the strongest presumption is, that the proclamation against Bacon was issued *after* his attack on James Town." Now T. M's. account in this particular, is confirmed by Keith's Hist. of Va. p. 160, and Marshall's Life of Washington (old edition) vol. i. p. 198.

Again your correspondent objects, "that assembly passed an act disabling Edward Hill and John Stith to bear office." This act charges *them* with being the *greatest fomenters* of the late disturbances, the writer of the above article [T. M.] states that Edward Hill was a member of that assembly."

In answer to this, it may be observed, that there is nothing incredible in the supposition, that Edward Hill while sitting a member of the house of burgesses, was disfranchised. In England, members of parliament, great lords even, have not seldom been translated in a hackney coach, from St. Stephen's chapel, to the tower of London. The case of Sir Francis Burdett will readily occur to the reader.

"It is not probable that Bacon would have been so unguarded, as to go to the legislature, when he was proclaimed an outlaw."

On this it is only necessary to remark, that Bacon had the people and the legislature both on his side; a safeguard sufficient to fortify a less resolute and impetuous man than Bacon.

Such are some of the errors objected to the Stafford manuscript; whether they are of sufficient force to throw a cloud of discredit on that document may be safely submitted to the ingenious reader. The following is Mr. Jefferson's opinion of this manuscript, as contained in the preface thereto: "It appears to have been written by a person intimately acquainted with its origin, progress and conclusion, thirty years after it took place, when the passions of the day had subsided, and reason might take a cool and deliberate review of the transaction. It was written too, not for the public eye, but to satisfy the desire of minister Lord Oxford; *and the candor and simplicity of the narration cannot fail to command belief.*"

This manuscript is relied upon, by Hening Stat. vol. 2. p. 130; Bancroft's Hist. of U. States, vol. 2. grand rebellion *passim*. If then the authority of this manuscript is established, it may be referred to, in regard to the following observation of your Williamsburg contributor: "it does not appear that they [Lawrence and Drummond] were concerned with Bacon *prior* to June, 1676."

On the contrary, Lawrence appears to have been generally considered, at the time, the prime mover and main-spring of the rebellion; "the received opinion in Virginia, which very much attributed the promoting these perturbac'ions to *Mr. Lawrence*, and Mr. Bacon and his other adherents were esteemed as but wheels agitated by the weight of his former and present resentments." Staff. M. S.

I return now to an inquiry, into the grounds of the statement in the Intelligencer, quoted before: "an article under this head published in the Petersburg Intelligencer, states that Nathaniel Bacon (called the rebel) was a member of the council. I doubt it. Where is the evidence?" In reply, I would rely first, on T. M's. account, who says "about a minute after this, the governor starting up from his chair, a third time, said "Mr. Bacon! if you will live civilly but till next quarter court, (doubling the words) but till next quarter court, I'll promise to restore you againe to yo'r place there, pointing with his hand to Mr. Bacon's seat, *he having been of the councill before these troubles*, though he had been a very short time in Virginia, but was deposed by the foresaid proclamac'on; and in the afternoon passing by the court door, in my way up to our chamber, *I saw Mr. Bacon on his quondam seat with the govern'r and councill*, which seemed a marveilous indulgence to one whom he had so lately proscribed as a rebell."

And this fact he reiterates in several different forms of expression, so that it is quite inconceivable that there can be any mistake in the case, especially as it regards so conspicuous a man as the younger Bacon. So that the statement, if not true, must be a downright palpable wilful falsehood, as will be evident to any one who will read the account. But your Williamsburg correspondent does not deny that this account is "substantially true," therefore, unless a document "substially true" can contain a gross falsehood, it follows, *ex necessitate rei*, by his own admission, and the internal evidence of the document itself, that the statement in question is true.

Nor is it possible to conceive, that T. M. could have confounded the younger Bacon, with the elder, as will appear sufficiently manifest from the following passage in his account: "And so much was true, that this Mr. young Nathaniel Bacon [not yet arrived to 30 years] had a nigh relation, namely, Col. Nathaniel Bacon of *long standing in the council*, a very rich politick man, and childless, designing this kinsman for his heir, who [not with-

out much paines] had prevailed with his uneasy cousin, to deliver the fore-mentioned written recantation at the bar, having compiled it ready to his hand, and by whose meanes 'twas supposed that timely intimation was convey'd to the young gentleman to flee for his life," which passage immediately succeeds the one quoted above, "forasmuch as the taking Mr. Bacon again into the councill, was first to keep him out of the assembly, &c." If it is to be inferred from its not appearing in Hening, that Bacon the younger was not of the council, we must on the same ground infer that Berkley issued no proclamation against him, for I think none such is to be found therein; but your Williamsburg correspondent admits there was such a proclamation issued. There is an *hiatus* in the records of that period; the name of Bacon the younger would no doubt be expunged by the vindictive Berkley, from the list of councillors, even if that list escaped the conflagration of James Town.

There is no impossibility in their being two councillors of the same name at the same time. Benjamin Harrison of Berkley and Benjamin Harrison of Brandon, were both members of the council at the same time, early in the revolutionary period.

The following authorities agree in asserting that Bacon the rebel was of the council. Keiths History of Virginia, p. 156, Beverley's Hist. of Va. p. 68, Marshall's Washington, vol. 1. p. 198, Encyclopœdia Americana, Biographical Dictionaries of Lempriere, and Blake, Article Bacon, Robertson's History of America, p. 424.

I am ashamed to have occupied so much space, on a point of mere curiosity, and in a discussion which I am aware is a little out of the line of your work; the more so, as the article in the Intelligencer consisted of notes scratched off some years since from Beverley's Hist. of Virginia, at a James river seat, where I met with it for the first time, and the misstatement (if one) might safely have been left at his door. But although that writer is often loose and inaccurate, in this particular instance, he seems well sustained, as I trust will appear to the candid reader.

Your most obedient servant,

CHARLES CAMPBELL.

Petersburg, August 9th, 1839.

ON FATTENING HOGS, BY COLD-SOAKED AND FERMENTED FOOD.

To the Editor of the Farmers' Register.

August 31*st*, 1839.

You complain very justly, I think, that many of your first contributors have grown weary in well doing; in other words, that their communications have greatly fallen off in point of numbers. Although I myself am unconscious of being one of the culprits, I determined immediately upon reading your remarks, to act as if I really was one, and felt anxious to evince my repentance by forthwith inditing to you an epistle of some kind or other; but could think of nothing, at first, that appeared worth communicating; luckily, however, in the midst of this quandary, I picked up at second hand, from a friend, something in regard to the mode of fattening hogs, which seems to be well worthy of notice.

First, however, I must tell you, that having, for a year or two past, enrolled myself in the fraternity of root-steamers for stock, (horses and sheep excepted,) my own experience is not yet sufficient to report to you any result of trials made by myself. I must farther confess that, as a novice in the steaming business, I still retain somewhat of that incredulity which I always feel relative to the benefits of any practice, when they appear to me so exaggerated as those do that are generally ascribed to the steaming process. But being open to conviction, and utterly condemning the old and common wasteful method of fattening our hogs, I was much gratified to hear the account which I will now give you of the mode practised by some gentleman, whose name I forget, in King & Queen or King William.

One or more casks or tubs are nearly filled with alternate layers of chopped cabbages or roots, and broken ears of corn. Enough boiling water is then poured into the vessels, to cover the food. This is suffered to stand about 24 hours before it is given to the hogs, by which time some fermentation takes place, if the fattening process is commenced as early in the season as he commences it, which I understand he does long before frost. A constant supply of this food is given until a very short time previous to the hogs being killed, during which they have corn alone, which is generally deemed necessary to harden their fat.

By this method we may save the expense of steaming apparatus of every kind, such as have been heretofore recommended in our agricultural papers. It is true that some of these cost very little compared to the advantages derived from them; but this little, even in the cheapest that I have seen mentioned, is worth saving, if it can be done by some contrivance still cheaper, and preferable on other accounts, as the one which I have just described, appears to be.

I am gratified that I have it in power to give you the foregoing information at this particular time; for I have long been convinced that we should probably save, at least half the expense of fattening our pork, if we would commence doing it by the first of September, or even sooner, and give much less corn than we generally do. To postpone putting up our hogs for the sake of the acorns and chinkapins that they may be able to find by incessant travelling about in search of them, is as complete an illustration as I have ever known of the old proverb,—"*penny wise and pound foolish*:" since to say nothing of the notorious fact that *hogs especially*, fatten much faster in warm weather than in cold, and when they can fill their bellies without having to travel miles for the wherewithal, (being the laziest animals upon earth, except the gluttonous man, and his prototype, the quadruped called the sloth,) more of them are lost by theft, if suffered to run at large, during the nut and acorn season, than would pay, twice over, the whole expense of feeding them in pens with food that cost us little or nothing, except the labor of collecting and preparing it. Even that portion of this stock which we call "*out hogs*" could probably be kept much more economically, if not suffered to run almost wild for half the year; and were supplied with food by their owners, instead of being left to supply themselves. As they are commonly managed, we may truly estimate the annual loss, in most cases, at nearly or quite

half of the whole number; for many are killed for trespassing on our crops—starvation during three-fourths of the year, having taught them to be thieves; whilst a still greater number are stolen in the fall, after they get a little flesh on their bones, for a reason which I once heard alledged by an old negro in extenuation of the practice of stealing them, that "hog meat was so miserable sweet his fellow *sarvants* could not help stealing it."

Hoping that you will deem this new process for fattening hogs worth publishing, I remain, dear sir, Yours very sincerely,

JAMES M. GARNETT.

MEMORANDA.

To the Editor of the Farmers' Register.

New Kent, August 10th, 1839.

As you desire that communications of an agricultural nature should be made to you, and complain of the lack of them, I, a poor illiterate, unpretending humble clod-hopper, venture to offer my mite or mites for a place in your columns, hoping above all things that they may elicit a spirit of inquiry; arouse the latent and dormant energies, and awake the industry of the poor farmers of eastern Virginia. My remarks will be of a desultory nature, and made regardless of the rules for writing.

Chinch bugs.—Whilst some would fain know from whence they came, when, and whither they will go, let us prepare, in the most reasonable and prudent way, to counteract their ravages. That they have done much damage in the county of New Kent, is notorious, but that we may expect they will do infinitely more the ensuing year, is more than probable. During the months of June and July they copulate, and surely nothing ever seen on earth before is to equal the number of nuptials in so short a time; and from the different sizes of their progeny I would infer that they teem but a week. Now, in my opinion, it is not the scalding with water, tarring, or ditching, that will arrest their progress, but the sowing of clover next spring on all the wheat and oats. I made a crop of good wheat this year, when some of my neighbors was not worth cutting. Mine had been seeded down in clover this spring, my neighbors was not.

Marl and lime.—My crop of corn is as good as I ever saw. The land is of a medium nature, neither very stiff nor very light; has been worked (no doubt) long before the settlement was made at James Town, and never improved 'till I commenced with it a few years past. Of course it had become almost steril. I threw on it some lime and some marl, and the alteration is like magic. I give the preference to the marl, mine being of the small-shell kind. I marled some land the past winter, that, heretofore, would not produce ears of corn longer than a man's thumb; now, the corn is excellent; I shall probably gather from it above three barrels per acre. I have been often asked this question, "would you cart marl from Mr. R's.?" My reply has invariably been, "yes, yes; instead of doubting of the propriety of carting marl four miles, I tell you I would haul it from Richmond, a distance of 40 miles, if I had none." I can demonstrate the propriety of my reply. Again, ninety-nine hundredths of farmers marl improperly. They put on too much, which is a very great error. Regardless of the nature of the soil, whether weak or dead, they put on a like quantity; the consequence is, loss of time, loss of labor, and death to the land. A quantity sufficient to counteract the deleterious effects of the acid in the land alone is needed—in general, 100 bushels per acre. On new lands or lands just cleared, five or six hundred bushels might not be too much. In short, marl is destined to be the great regulator of the prices of meats and bread-stuffs in lower Virginia. It is with us the true philosopher's stone, and literally will do for us all the philosophers ever promised, except that of perpetuating life; and even this it will in part do, for, in applying marl we have to labor, which is the soul of health and long life. I see no necessity now of running off to the west or south-west. All who have land and can marl, can make a superabundance here, and although they make in the south-west 10, 15, 30, 40 and 50 thousand dollars annually, every tinker of them returns here every fall, and after getting through with his bragging tables—he takes a man of marl by the hand, and says, "Old fellow! or old friend! walk aside with me. I have thirty thousand dollars worth of cotton; half I have sent on to Mobile, the other half I ordered should be sent on as soon as ginned, and, can you let me have $2000? I will give you any security. I have an immediate want, &c. Can you let me have $1000 or $500?" This has not a good look. Now every good is mixed with evil. We never shall have a dense population. We never will have one large town. If Richmond had additional water power equal to all at Lowel and Pittsburg, it can and will never be large. It is not necessary to give reasons. The evil that I allude to is this, that if marling and improving become general, we shall never sell our corn or wheat. It will be the least profitable pursuit that can be followed. Who will buy? It cannot be consumed among us, for the population is too sparse.

Clover.—Clover is an invaluable plant, and a coadjutor of marl in the important work of improving. With marl it is destined to make our lands produce excellent wheat, oats, rye, &c. It mellows and deepens the soil, makes the earth friable, porous, &c.; and I pronounce it that no man without it can raise a sufficiency of pork. If he does, he pays a shilling per lb. Hogs will grow and thrive on clover from the 1st of May till October, without any thing else but salt. This they should have twice per week. Every farmer who can clover, can raise an abundance of meat.

Hogs.—Hogs should have houses during the winter at least. We have no better, nor indeed any other food for them but corn. Of this grain they are very fond, and it requires a deal of it to keep them through winter. One thing I know from experience, and that is, all pigs should be either killed or given away if they are littered at any other season of the year except the three spring months; reasons are obvious. Those who now keep five sows should keep ten, and permit each sow to carry only four or five pigs at most. When fattening, we should frequently give salt to the hogs.

Manure.—Every farmer may, with ease, raise as much and even more manure at a very moderate price, than it costs him to feed his horses,

fatten his hogs, beeves and sheep, &c. I say the manure, if judiciously made, and husbanded, and applied, will more than pay him for all costs in feeding and fattening. Fallow the land and then carry out and spread the manure.

If you receive this hasty effusion, I shall in my next give an account of true nobility, and will show that the reason agriculture has languished in Europe and yet languishes in this republic, is, that in neither country have the great ones set the example. We all know what influence examples in high places have. The patriarchs were the only true nobles on earth. As to the nobility of Europe, its origin is but of yesterday, say six or seven hundred years ago. I intend to show that in former days the truly great ones of the world were not ashamed of husbandry. Cato the censor, David, Saul, Abraham, Isaac, Jacob. Hesiod flourished about 876 years before Christ, and and was the first poet who celebrated agriculture in verse. In our times there are many who would be ashamed to be found engaged in agricultural pursuits. Not so in former days with the truly great. The nobility of England within a few hundred years have done much for the cause of agriculture, and it is in a great degree owing to the efforts of the great landholders of that realm, that England is at this day the fairest and most fruitful land under the sun. W. X. Z.

VISIT TO THE FARM OF ELIAS PHINNEY, ESQ., LEXINGTON, MASS.

From the New England Farmer.

We have in the farm of this gentleman substantial proof of the efficacy of "book farming." He assured us, that his interest in agriculture was first awakened by reading the N. E. Farmer. Having received a classical education, he has, to be sure, the advantage of our farmers in general, for whom so little has been done by education,—we were prepared, therefore, in viewing his premises, to witness something a little extra, from what may be seen on well cultivated farms in general: but we found that our expectations had not been raised sufficiently high: we were in fact delighted and astonished to be made acquaintnd with the wonderful improvements which have been effected on this place since he began to cultivate it fourteen or fifteen years since. It was then a poor worn out farm, covered with rocks, whortleberry bushes, and scrub oaks; while the lowlands were inaccessible quagmires and alder swamps, of the most unpromising description—the whole farm, consisting of 160 acres, not affording more than 8 or 10 tons of hay, and all other crops in the same proportion; the fences out of repair, the fruit of an inferior qnality, fit only for cider; and every thing upon the place at sixes and sevens, as the saying is. It does not seem hardly possible that so much could have been achieved in so short a time. It shows what can be done by untiring diligence directed by science. It is a complete triumph of "book farming" over the old course of husbandry, handed down from father to son. Mr. Phinney has had the boldness to strike out of the old path, and in some instances pursue a course of his own invention. His improvements may be divided as follows:

1st. In planting upon the green sward without disturbing the sod.

2d. In clearing and draining his waste swamps and quagmires, and converting them into the most productive grass and cornfields.

3d. In clearing his uplands of rocks, and laying them into walls of the most durable and massive description—subduing the bushes in the unproductive pastures, and bringing them into fertile fields.

4th. In his orchard of apple trees, which for beauty, thrift, and produce can hardly be excelled.

5th. In his choice collection of fruits of every desirable variety.

6th. In his improved breed of swine.

7th. His barns and accommodations for cattle, swine, poultry, &c.

To which may be added many other improvements of minor importance, but which add to the interest, beauty, and profit of the place.

The idea of planting upon the green sward without disturbing the sod, has been ridiculed by a writer in the N. E. Farmer, vol. 17, page 317—as being impracticable especially in the potato crop. We saw an example of this operation, and one too of a most perfect kind, which we should suppose sufficient to convince the most sceptical. It was in a lot of three acres of potatoes. On the 20th of June there was a heavy crop of grass upon the ground, in addition to which twenty loads of compost to the acre was spread on, and at that time turned over; after ploughing, it was rolled with a heavy roller, (an implement by the way which should be in the possession of every one who calls himself a farmer.) The potatoes were planted in drills—had been hoed but once; yet hardly a weed was to be seen, nor a spear of grass daring to show itself, and sufficient earth, about the plants, with every prospect of an abundant harvest. In the spring this ground will be in fine order to lay down again to grass, and that too without disturbing the sod; or if advisable, planted with corn or any other crop.

Allowing the vegetable matter turned in equal to 20 loads of compost per acre, we have with that spread what is equivalent to 40 loads per acre. No wonder then that by following this process continually, he should be able to cut from 2½ to 3½ tons of hay per acre, which he actually does from his grass lands. He has another idea which we think important for a good crop of grass; that is, to sow an abundance of seed. His rule is 20 lbs. of clover seed per acre, together with a liberal allowance of herds grass and red top to boot. This would astonish most of our farmers, who can afford only from 4 to 10 lbs. per acre.

We saw a field of six acres of corn, from which a crop of 80 bushels to the acre is estimated, and provided we have warm weather sufficient to ripen any corn, we should judge the estimate not too high; the cold weather a few days past, is however against the corn crop. The variety of corn planted is called the Phinney—a fine long eared, twelve rowed variety, and earlier than the Dutton corn, to which it has some resemblance.

In another lot on his peat meadow, we saw a smaller field, on which the corn was more luxuriant and promising than on the one just named, and if that produces 80 bushels, we should not be surprised if this produced 100 bushels to the acre. Think of this, you that own unreclaimed peat meadows, and are longing for the fertile prairies of the

west; before you sacrifice your farms and bid adieu to the institutions and hills of New England, make an effort and bring them into subjection: it will prove an antidote to the western fever, or we are much mistaken.

We noticed a fine field of wheat of 8 acres, which the laborers were gathering into the granary. It appeared well filled out: the produce estimated at 20 bushels per acre: it was of the variety called the Black Sea, which we find succeeds best in the vicinity of Boston and most generally cultivated. We were informed that about 30 acres were under the plough the present season. Besides Indian corn, potatoes and English grain, Mr. Phinney cultivates the root crop extensively. His ruta bagas, mangel wurtzels, sugar beets and carrots looked very promising, and will afford an abundance of food for his numerous family of swine, and other stock.

In draining his low lands, Mr Phinney first cuts off all springs from the surrounding hill by a deep cut at the margin or outer edge of the piece, which is converted into a blind ditch: from this most important cut, the drains are made to the centre ditch. Where there is an abundance of stones as in this case, all the drains may be filled and covered over, so that the operations of the plough &c., may not be impeded. We were shown one piece over which it was dangerous for his cattle to pass, and in which they sometimes got mired, before he commenced the draining process; here his first essay on draining had been made, in which, though inexperience, he cut only the centre and cross drains; but with all he did, it would produce nothing but skunk's cabbage, hellebore, brakes, &c.; and it seemed that all his labor had been lost, until he learned the importance of the ditch around the margin, which produced the desired effect, and now it ranks among his most productive grass lots, and a loaded team may be driven without difficulty over it.

We were pleased with his system of digging peat, of which he has an ample supply. Where peat is generally dug, the grounds are left in the roughest state, and present an unpleasant and unsightly appearance, and remain an unproductive waste: but it is his rule to have the top spit, a depth of ten inches or a foot, (the portion unfit for the fire,) thrown over and levelled as the work of digging proceeds: in this way it soon becomes covered with grass, which answers very well for stock hay.

One peculiar feature of this farm is the massive stone walls by which it is enclosed and divided. It would seem a Herculean task to build the wall that has been put up under the care of the intelligent proprietor. In the measurement of the length of wall upon the farm, we may safely say there are miles of it,—we know not how much there may be on this subject we are not informed;—one piece of considerable length is 10 or 11 feet thick, seven feet high, and covered with grapes which have been set out on the south side of it; a fine native variety, found on the place. The vines were loaded with fruit, and bring by the quantity from 8 to 10 cents per pound: we should judge there might be a ton of them. All the other walls are double, from 5 to 10 feet thick and 5 to 6 feet high, and must have consumed an enormous quantity of stone. We noticed grapes upon many other portions of wall.

The orchard on this farm is equal if not superior to any we have seen. It contains from 400 to 500 trees, principally Baldwins, Russets, and Rhode Island Greenings. It produced a very abundant crop last year, but this year there is scarcely an apple upon it. It was planted some where about 14 or 15 years since. The soil is generally a light rich loam, upon a gravelly, and in some places a rocky foundation. The trees were taken from the nursery in autumn, and placed in trenches until the following spring. They were planted near the surface, and in many instances, upon the surface, without digging any holes, and the dirt placed upon the roots. The orchard is situated on a side hill, having a south and south-east exposure. Many of the trees were severely injured by the hard winters of 1835 and '36, which caused the destruction of some of them. Their places have since been supplied with young trees. The mice injured some of the trees a number of years since, by gnawing the bark so that in some cases the trees were completely girdled, and to all appearance lost. An ingenious method was devised to save them. Having prepared some large scions, five or six of them were inserted in each tree below the wounds in the bark, and then connected with bark above by the common operation of side grafting: in this way the sap was conducted from the roots to the top and the trees saved. We saw some of the trees thus operated upon: the scions had increased to the diameter of 3 or 4inches, and had nearly come in contact with each other: we should doubt, however, whether the trees would be long lived, as the old wood must be unsound, and an early decay must be the consequence. The trees appeared now as vigorous as any of their neighbors. The orchard has never been laid down to grass, but kept in constant cultivation. The trees are finely shaped, having been pruned with a skilful hand, and just high enough from the ground to work under without inconvenience: the trees are about two rods apart: in some places they nearly cover the ground. We do not remember how many barrels were gathered for the market last year, but the quantity was great. Besides this orchard, there is another that has been set out only 2 or 3 years, of 2 or 300 trees, all of which are sweet apples, designed expressively for the swine. All the refuse apples are fed to the hogs, and considered much more valuable for that use than for cider.

The farm is abundantly stocked with pears, plums, peaches, grapes, &c. There are more than 2000 fruit trees of various sorts upon the place, and all have been reared and pruned by the hand of the proprietor himself.

One of the most pleasant sights is a trellis, 30 rods in length, covered with the Isabella grape, from which was gathered last year two tons of grapes, which found a ready sale in Boston market at 10 to 12 cents per pound. The crop was said not to be so heavy this year, but to us it appeared very great. There is also a small house where the more delicious foreign grapes are grown.

The plums had suffered severely from the curculio, and most of the trees had lost their fruit. There is a disease upon the currant bush, which we have noticed in many other places as well as on this. The bush loses its leaves prematurely, and the fruit becomes withered and worthless.

We have in vain sought for the cause. Can any of our readers inform us, and prescribe a remedy? The vegetable garden is large, and well stocked with every variety: what is not consumed in the family is marketed or fed to the swine.

Mr. Phinney has taken great pains to improve his breed of swine, and probably there are none superior in the state. As we have a promise from him of a description of his pigs and piggery for the 'N. E. Farmer,' we shall not enlarge upon this subject. He prefers a cross of the Berkshire and Mackey to any other, and most of his pigs for slaughter are of this description. He has the full blooded Berkshire, Mackey and other breeds, and mixes to suit himself. We noticed a sow lately imported from England, called the Essex half black: the hinder part of the animal is jet black, and the forward half, white. There are some good points about her, and she may prove a valuable acquisition to his stock: not having recovered from her sea voyage, she does not appear now as she will after a few weeks of good keeping. There is an old sow near quite an object of curiosity, (we do not recollect the breed,) that weighs 900 lbs., a monstrous overgrown animal: she had been turned out of her pen to enjoy her liberty a little, which she did not however, seem to appreciate much, as all the room she wanted appeared to be enough to turn round and lie down upon. She looks as though she might be the parent of a most numerous offspring, but we understood she was without issue, having apparently no inclination to form an intimacy with the other sex. The number of swine is about 140, the care of which employs one man constantly.

The barns and other buildings for the accommodation of stock are convenient and comfortable, with sufficient room for the hay and grain produced on the farm. About 100 tons of hay are cut annually, part of which is sold. For every ton of hay sold, one cord of manure is purchased. To improve the land and keep it in high tilth, it is necessary of course to manufacture a large amount of manure. This is done first by the hogs. The man who has the care of them is constantly employed at odd hours in furnishing them materials, such as meadow mud, peat, weeds, &c.: second, by sheep: in autumn 150 or 200 wethers are purchased from the droves, and fed through the winter: by March they are in good flesh, and bring a high price, and pay well for their keeping; their yards being furnished with a plenty of mud and litter, when mixed by their excrements makes a rich compost: third—by the other stock and the manure purchased, which is carefully mixed with twice the quantity of meadow manure. One cord of this compositition is considered about equal to one cord of stable manure alone.

In making our observations upon this place, we feel as if it was not in our power to do it justice, as we spent but a few hours upon it. Every part of it shows, that by science, industry and skill, it has been rendered worthy of being ranked among the first of well cultivated farms in New England, and its proprietor worthy of all praise for the laudable examples he has set for the imitation of his agricultural brethren.

THE ENGLISH [OR JERUSALEM] ARTICHOKE.

From the Southern Cultivator.

We have been requested, by a gentleman of Mississippi, to direct the attention of our farmers to the more extensive cultivation of the English Artichoke, as an excellent article of food for hogs. It is now cultivated by some of our farmers, but upon too small a scale, considering its great value. We learn that Judge Caruthers, and Mr. F. H. Gordon, of Smith county, have about 12 acres each, now growing, which will afford food for near four hundred hogs from the first of November till planting time.

The artichoke requires but little labor in tilling, and is very productive. The roots will remain in the ground safe during the whole of the winter; the stalk and the foliage furnishing an excellent protection from the frosts, and enriching the soil greatly. The hogs can be let on them the 1st of November, and remain till spring, when they will be in prime order. A portion of the ground cultivated should be set apart for seed—the seed to remain in the earth where it grows till spring—then taken and planted about the time sweet potatoes are planted, with about the same amount of seed per acre. Thus four bushels of seed will plant an acre of ground, and require one ploughing and hoeing, and keep 30 or more hogs from the 1st November till spring. If our farmers do not pay more attention to this, they certainly are blind to their interest. Seed, we presume, can be had quite plenty next spring.

RHUBARB, OR PIE PLANT.

From the Genesee Farmer.

This is a valuable plant, and should be found in every garden. The original species cultivated was the *Rheum raponticum*, as was found wild in abundance on the banks of the Wolga, in Russia. Several new species have been found in late years, such as the *R. australe*, *R. palmatum* and the *R. enodi;* but from the earliest ages, the medicinal qualities of the plant appear to have been well understood, and for these virtues it was generally cultivated. Now, though the opinion of its medical efficacy has not perhaps been in the least lessened, it is principally grown for the sake of the stems of its broad leaves, of which extensive use is made in the various departments of domestic cookery. In this country the great demand is for pies, for which they are unrivalled, while in foreign countries the stalks are served up in cream, made into preserves, into tarts, in which form medical men have recommended them as the most cooling and wholesome of any placed on the tables of the opulent, or indeed of any classes. For making preserves, the London Horticultural Register, recommends the following mode. Let the stalks, peeled, be cut into squares, put in single layers on a pan, and placed in an oven of a moderate heat for about twelve hours, and afterwards be put into wide mouthed bottles, with a fifth or sixth part of brown sugar, then covered down with a bladder, and occasionally shaken for the first fortnight.

Of the kinds cultivated, Wilmot's and the Gigantic, numbers 1 and 7 of the London catalogue, are considered the best, as producing the greatest yield and being of good quality; though for some of the more delicate kinds of tarts, Dr. Thompson, who says he has tried all the varieties, gives a decided preference to the palmate leaved variety.

The soil has a very great influence on the qualities of the plants; in a strong or very wet one, the plants will incline to a rank flavor, but if in a light rich soil, they will be large and succulent, without without being unpleasant flavored in the least. Rhubarb may be propagated either by seed or offsets from the roots. The first is generally considered the best method; though the last is much practised, and succeeds well, if care is taken to retain a good bud on the section removed. The ground must be well trenched and manured; the earth rendered fine and well mixed to a good depth, and the seed sown, or the roots set, as early in the season as the earth will allow. If it is intended to grow the plants in the open air, operations must not commence as early as when they are to be forced, a process extensively adopted by gardeners near cities, as bringing the plant early to market.

Rhubarb is forced by means of hot beds, or any of the modes of producing an artificial atmosphere in cold weather, adopted by gardeners; but it is usual to combine blanching with forcing, as giving plants not only of good quality, but of fine appearance. Blanching is accomplished in various ways, all having the same object, that of excluding light from the plants while growing. Large pots turned over the plants, over which manure is heaped, are sometimes used, where blanching and forcing are united. Others cover a bed of plants with an open frame worked of wood, on and around which the manure is placed. This mode is preferred, as giving greater scope to the plants, and by embracing a large area, being less expensive on the whole. Some of those in this country, who have been most successful in the culture of the pie plant, recommend that a barrel from which both heads are removed be set over the plant, and around which the manure must be placed; a board placed close over the top excludes light, and the blanching is effected readily. When additional forcing is required, the top of the barrel as well as the sides may be covered.

Great care must be taken in planting rhubarb, not to have the plants too near. Five or six feet will give better plants than three or four; and it is a good plan to cover the crowns of the plants during the winter with a few inches of rotted manure; thus giving an early start to the vegetation. Little more culture is required after planting, than to keep the beds free from weeds during the summer, and forking in a good dressing of well rotted manure each spring. Dr. Bevan directs that no stalks be gathered the first year, and that they always be cut sparingly towards the last of the season, so as not to exhaust the roots too much. If this is not attended to, spindling weak shoots will be the result.

HOLKHAM, THE SEAT OF THE EARL OF LEICESTER.

From Bentley's Miscellany.

The grounds, including gardens, and park, and forest, and meadows, and fields of corn, are bounded by a circumference of ten miles. Within this circumference is an artificial lake, regarded by many as the most superb in England. Walks and rides intersect these grounds in every convenient direction. Here you move under a triumphal arch; before you, arises soon a lofty obelisk; upon your right spreads out five hundred acres of barley; and anon you enter Lady Anne Coke's beautiful flower garden, planted by the taste of Chantrey. Sheep, whereof here are twenty-two hundred of the veritable South Down breed; cattle, of which there are three hundred belonging to the stock of Devonshire; milch-cows, whereof thirty constitute the dairy; horses, whereof fifty enjoy stalls at Holkham; tenantry, of whom two hundred are happy to acknowledge this excellent landlord; and laborers, of whom two thousand are said to be continually employed by him, meet your eye wherever it is turned; and nearly in the centre of this circumference stands the House of Holkham—a magnificient pile. It was erected about 80 years since by the Earl and Countess of Leicester. It consists of a large central building with four wings, and you are informed that, "measuring closely by all the angles," it is just one mile in circumference. The house is open for public inspection on two days of each week; and well may it thus be opened, for it contains treasures in tapestry, sculpture, and painting, that richly repay the visitor for his time and trouble. In this repect, as a repository of art, Holkham is one of the many valuable houses in England. There is in England no Louvre, England is truly rich in works of art; but they are scattered—a Claude here, a Titian there, and distant a hundred miles or more, amidst sculpture both ancient and modern, may be found a Salvator Rosa and a Raphael.—

NEW REAPING MACHINE—GREAT SAVING.

From the Farmers' Cabinet.

On the 4th of July the farmers of this neighborhood enjoyed the pleasure of seeing the reaping Machine, invented by Mr. O. Hussey, of Baltimore, operate upon a field of wheat. Mr. Hussey had been invited to exhibit his machine before the "*Society of St. George's and Appoquinimink for the Promotion of Agriculture,*" and the 4th of July was named as the day, and true to his appointment, Mr. Hussey and his patent reaper made their appearance. Hundreds of farmers were assembled to witness it, and many were the doubts, surmises, and criticisms upon the machine as it was viewed over and over as it lay in readiness for trial. Some time after Mr. Hussey's arrival, the society was called to order, and the declaration of independence was read, while the greatest order and attention prevailed; after which the society adjuorned to the dinner-table and partook of an excellent dinner, prepared for the occasion. These interesting preliminaries being despatched, and all things being in order, *the two strangers* (Mr. Hussey and his machine) were duly introduced to a field of standing grain, ripe and ready for the sickle, and in the twinkling of an eye the machine was off, clipping and cutting, and saving the grain in beatiful style. A cleaner and more even stubble could not be produced. All doubts vanished in the minds of the spectators. Every head of wheat was saved, and the machine was drawn with apparent ease by two horses, and

cutting at the rate of from twelve to fifteen acres in a day. The machine was forthwith purchased by the society, and reserved for future trial, which has since confirmed them in the good opinion they had of his capabilities. All who have witnessed it express themselves satisfied, and many are intending to provide themselves with machines for the next harvest. Thus, through the influence and exertions of the agricultural society, we may expect next year to see this valuable labor saving and grain saving machine fairly introduced among our farmers. It is a difficult matter to describe the machine so as to convey a proper idea of its structure; I hope, however, that many will be induced to see for themselves, and they may rely upon having all reasonable expectations realized.

Yours, &c., N.

Middleton, Del., July 15, 1839.

CURE FOR THE POLL EVIL.

From the Franklin Farmer.

Lake Court House, Ia. March 20, 1839.

DEAR SIR—In your paper of the 2nd instant, is a "cure for the poll evil" in its incipient state. Here is a cure for it in its worst state:

When the swelling breaks, or if it has been sometime a running sore, it will have a pipe or tube from which the matter discharges—into this crowd a lump of pearlash or potash, as big as you can with your finger. Three such applications will cure the worst case of poll evil or fistula I ever saw.

Your friend,

SOLON ROBINSON.

TO THE CONDUCTOR OF THE FARMERS' MAGAZINE.

From the Edinburgh Farmers' Magazine of 1807.

Sir,—A series of letters from a young farmer to his father lately fell into my hand, and I take the liberty of furnishing you with a copy of them, trusting they may in some respects be amusing, and perhaps interesting to your readers. It appears that the young man had been sent to learn the art of agriculture in its various branches, under an extensive farmer who resided in a neighboring district; and was employed in the character of a head servant, or as one to whom a particular department of work was entrusted. From a young person so situated, you are not to expect a great portion of information, or many important remarks, though I entertain few doubts with regard to the degree of interest which may be taken in the details given of the several articles of farm business which came under his view. For the sake of connexion, I have arranged the numerous letters before me into four classes, each of which is applicable to the business executed at the different seasons of the year; and I eagerly hope that such an arrangement may be useful and advantageous. I have only to add, that the letters were wrote several years ago, and am yours, &c.

PHILO-GEORGICON.

CLASS 1st.—*Dear Father*,—Agreeably to your desire when we parted, I sit down to give you some account of my reception at Barnhill, where I arrived on the second day of my journey. I found Mr. Jamieson at home, and was received in a kind and friendly way. He first introduced me to his wife and daughters, and showed me the apartment which he said was to be mine during my residence with him. You may believe I was a little discomposed by the sight of so many new faces; therefore Mr. Jamieson kindly proposed a walk for an hour or two through the farm for my relief. The farm appears to be very extensive; but on this point I will afterwards speak with more precision. After work hours, I was introduced to each of the principal servants, who were informed as to the object of my coming to this place, and desired to give me every manner of countenance and assistance in their power. Mr. Jamieson says I am to have a charge also, but has not communicated the nature of it. I shall write down my observations carefully, and send them as opportunity occurs. Bell rings for supper. I find every thing here is conducted in a regular way; and that though all seem to be in a *haste*, yet none are in a *hurry*. I have often heard you illustrate the difference betwixt these two terms, and now believe that I will see it practically exemplified.

February 5.—Mr. Jamieson has this day sown a large field with wheat, which field carried turnips last year, and had been regularly ploughed as the turnips were consumed or carried off. He desired me to attend the pickling process, which was carried on early in the morning by the different sowers, under the inspection of the head ploughman, and executed in the following manner. A quantity of stale urine being provided the preceding evening, and several bushels of hot lime shells laid in the house where the process was to be gone about, the wheat was thrown on the floor in small quantities at a time, and sprinkled with the urine out of a garden watering pan. When something like twenty bushels were wetted, the heap was turned over, and carefully mixed, after which hot lime was riddled upon it; and the like process commenced with another heap, till the whole was finished. Carts were then brought to the door, and the grain taken to the field, where it was soon deposited in the earth. Five sowers and thirty harrows were employed. The whole work was completely over before the evening, and grass-seeds were sown upon the field previous to the harrows going over it the last time. Three double times of the harrows were given; the first in length or for *breaking in;* the second across, which pulverized the ground sufficiently; and the last in length, as a covering to the grass-seeds. It was chiefly white clover and a sprinkling of rye-grass, that were used. The field was, lastly, neatly water furrowed, and presents a most husbandman-like appearance. I have been more particular in this description, because wheat, at this season of the year, is a rarity with you; and I don't remember of having seen you sow grass-seeds so early. I hinted to Mr. Jamieson, that there might be some danger to the seed, from the frosts in March and April; but he answered, that repeated trials had satisfied him that no hurt was to be apprehended. Indeed, experience must be the best guide in this and every practice.

February 10.—Mr. Jamieson is very throng at present, being just beginning his pea and bean seed. He lays down, as a positive rule, always

to rise from bed at least an hour before day-light, I mean at this season of the year. By which means, he gets sufficient time to deliver his orders to the several head servants before work hours commence; but his method of doing those things shall be described hereafter.

A few days ago Mr. Jamieson showed me his farm, which, I believe, contains about two thousand acres, apparently of excellent soil; though, at this season of the year, a stranger, especially a novice like me, may fall into great mistakes. It took us four hours on horseback to survey the whole, so you may figure the difference betwixt the extent of business executed here and with you, whose farm may at any time be perambulated before breakfast. He told me, in the course of our ride, that he would, at some leisure hour, give me a sketch of his management. In the mean time he has entered me to business; and you will no doubt wonder that I am capable of a charge so early. Why, then, my business is to oversee the odd men or laborers, that is, the servants not employed at plough or barn-work, or about the live-stock. Mr. Jamieson says he will give me some help till better acquainted with the men, and the nature of their work; but that, afterwards, I must look sharp about me, and see his orders faithfully executed. I intend to use my best endeavors, both on account of honor and interest, because, were I to be negligent, I foresee that my removal would be the immediate consequence, which would not only be disgraceful to my character, in the first instance, but eventually detrimental to my future prospects. In a word, I have got ten men to superintend, which, to be sure, is something like a sergeant's command; and, to keep them tight and tractable, will require all my small stock of prudence and exertion.

The implements belonging to my men have been formally delivered to me with a catalogue of the whole. When *tear* and *wear* occurs, I am directed to mark it down, and produce the broken or disabled implement at the end of each month, when the catalogue will be examined, and the deficiencies supplied. These I consider to be excellent measures; and believe that heavy losses, both from pilfering and negligence, are sustained by most of farmers from the want of them.

I shall furnish you with a copy of my catalogue, which, at least, may amuse you.

10 spades.	10 small do. for spreading dung.
10 broad shovels.	10 forks.
10 narrow do.	10 scythes.
10 picks or mattocks.	10 scythe stones.
A complete set of quarry implements.	30 hay rakes,
10 pair wool scissars.	10 wheel-barrows.
10 hedge hooks.	10 hand-barrows.
6 pair hedge scissars.	6 bean drills.
10 strong grapes.	6 turnip do. of different kinds.

Taking care of these articles, and keeping my *corps* of 10 men at work, I am vain enough to consider as sufficient for me; at least, I am almost certain that one-half of the farmers in the island have not so much to look after.

We must now enter to work. The day after I got my commission, I went to the office with the other head servants. There each got his orders, which Mr. Jamieson, to prevent mistakes, delivers always in writing. Mine were as follows, and I send it to you as a sample.

Orders for George Campbell. Feb. 10.—John Jackson, Peter Simpson, and James Hay, go to the quarry; William Hay, and Thomas Kemp, to plash hedge in Brickfield park; Donald MacLean, Alexander Martin, and John Fraser, to turn compost middens; Archibald Kinnear, and James Dods, to scour ditch at the under end of the Cross-gate park.

This order, with a memorandum concerning the work executed, Mr. Jamieson directed me to deliver to the clerk at night, who then enters it in the books. This you will say is going very regularly to work; but where so much is to be done, there is a necessity for method, otherwise confusion would be the consequence.

Our head ploughman tells me, they have sown 20 acres with peas this day, which are all done off and water-furrowed. He says the ground harrowed tolerably well, and left a round clod upon the surface. I understand that beans are to be drilled to-morrow, six of my men being directed to wheel the drill-barrows.

February 16.—Mr. Jamieson's business now begins to open upon me. He really manages a great deal of work, and does every thing without noise or confusion. He is indefatigable himself, and takes a great deal of fatigue; but keeping little company, and that only of sober people, he is almost constantly employed one way or other upon his farm; and when he has visitors, his way is so well known, they never trouble him with bad hours. He is an early riser, laying down for a rule, as already mentioned, to have all his orders delivered before the working people attend. His house is well furnished, and abundantly supplied with good victuals of all kinds. There is one table kept for himself and family, another for the head servants, and a third in the kitchen; and a full supply is regularly presented at each.

He sent for me last night into the parlour.—Well, George, said he, how do you like your office? Pretty well, I replied, sir, providing I fill it to your pleasure. Why, not worse than might be expected from a beginner. Time and attention, I hope, will produce improvement. But sit down. I promised to explain, some day or other, my mode of management, and, having a leisure hour, shall be as good as my word.

This farm contains altogether about two thousand acres; and, when it came into my possession, was divided into eight separate farms; but, as I had long entertained an inclination to try farming on a large scale, I ventured to take the whole, though at the time in miserable order. Indeed, it has always appeared absurd to me, that the occupation of a farmer should, by custom, be restricted to certain bounds, while the merchant or manufacturer is encouraged to extend his trade or business proportionally to the extent of his capital stock. With these views in my head, and a decent sum of money in my pocket, I settled here, and proceeded to realize my former opinions. This house, and all the adjoining offices, were erected by me, the old houses and steadings being widely scattered over the ground, and of little use, except such as were preserved for cottages. You see I am tolerably well provided with accommodation of every kind, both for a great number of servants, and a large stock of bestial, which things are absolutely necessary, if farming is meant to be carried on with comfort and profit. My landlord aided me in the buildings, by furnishing one thousand pounds; but the sums I have expended,

at different times, are three times above the amount of the assistance thus obtained; though I don't grudge such expenditure, because I consider every half-penny of it to be well applied.

It required a considerable time before I got the farm arranged to my mind, much of it being formerly run-rig, and intersected by balks. However, by summer-fallowing to a great extent, and throwing in plenty of clover and rye-grass, I, at last, got the whole into regular breaks of one hundred acres each. Part is enclosed, and a considerable proportion remains open field; but this I don't view as attended with much detriment, where corn is the chief object. The enclosures that I have are good; and this I consider as of more importance than having many of them.

My method of cropping is very simple, and regulated upon this principle, that the earth delights in variety; therefore, I chiefly follow what is called the alternate husbandry. As for a regular rotation, in the strict sense of the term, I never followed any thing of that kind, but limited my mode of cropping to a sequence of white and green crops, without studying particularly what variety of each was to be cultivated; and abstractedly speaking, to take culmiferous and leguminous crops alternately, I hold to be the *ne plus ultra* of good farming. No doubt this plan at times has been broke through, because seasons and other circumstances have rendered a departure from it necessary; but where it can be adhered to without material inconvenience, I am clear that the departure therefrom should be carefully avoided.

My last year's crop consisted of 250 acres of wheat, whereof 100 acres were after summer fallow, 50 acres after turnips, and 100 acres after beans and peas; of 150 acres of barley, whereof 50 acres were after turnips, and 100 after beans and peas; of 300 acres of oats, whereof 100 acres were after clover, cut and used in the stable and straw-yard, and 200 acres after pasture grass; of 200 acres of beans and peas, most of them drilled; 100 acres of clover and rye-grass sown amongst fallow wheat; and 800 acres of pasture grass. These, with 200 acres in summer fallow, turnips and potatoes, comprehended the whole of my farm, and in my humble opinion, made the system so complete as almost to ensure a succession of good crops.

You will attend, that as I sow grass seeds along with the grain that succeeds summer-fallow and turnips, and also with 100 acres of barley, which followed drilled beans, I am enabled to retain the like number of acres each season in grass; because three breaks of grass, one after cut clover, and two after old pasture, are ploughed in each year. This gives a regularity to labor, always desirable; and serves, under a parity of circumstances, to keep the whole of my farm in equal and uniform good order. I by no means, however, adhere to the number of acres in each grain condescended upon as forming the crop of last year, because I have sometimes taken wheat on the clover break, and at other times have substituted barley for wheat on the breaks which had carried beans and peas. My aim is to have culmiferous and leguminous crops alternately; and this being attained, I am not rigidly studious to preserve the quantities of each already mentioned. If I have 700 acres in white crops, 1200 acres under leguminous crops, and 100 acres in naked summer-fallow, I am perfectly satisfied.

I hope that a kind of rough view is given of my farming system; and at a future time, shall be ready to afford any explanation which you may suppose to be necessary. I never thought farming a mystery, nor do I think that good can arise from keeping any branch of it secret and concealed, as attempted by many of our brethren. My opinion is, that the more generally a knowledge of husbandry is diffused, so much more will the public be benefited; and that the man who has gained wisdom in the school of practical experience, and refuses to impart a share of it to others, acts a part not less inimical to the public good, than he who, having discovered a remedy for a pestilential disease, obstinately keeps the secret to himself, without benefiting society by the discovery.

The above is the substance of Mr. Jamieson's conversation. I really think him a sensible man, and, although quiet, yet, by an active turn and disposition, eminently qualified for the line of life he has chosen. You may be assured that I shall study to cultivate his good will, being certain that the possession thereof will tend much to my advantage, though equally sure that it is not to be gained unless attention to business is punctually bestowed.

I forgot to mention, that the first day I entered to business, Mr. Jamieson accompanied me through my several stations, and gave me particular directions how each branch of work was to be executed. He also instructed the men to give absolute obedience to my orders, and to act under me with the like promptitude and discretion as if he were on the spot himself. I am authorized to dismiss immediately any one who acts unfaithfully, or neglects his duty; but this authority shall be administered with prudence, though with justice to the interest of my worthy employer.

February 28.—I am sending letters very frequently; but were I to do otherwise, one third of what I learn every day could not be communicated. The obligation conferred in sending me there is great indeed; and assuredly, if I am not taught farming in all its branches sufficiently, it is not for lack of opportunities.

It was stated in a former letter, that Mr. Jamieson had several head servants, to whom his orders were entrusted. I am now well acquainted with them all, and shall attempt a description of each, and their respective duties.

The first is the head ploughman. His name is James Elliot. He is a middle-aged man, is a complete ploughman, perfectly capable of teaching an ignorant fellow to manage the plough in the best style, and ,in short, qualified to execute every branch of field work. He has eighteen ploughs under his inspection; seldom works himself, but accompanies the ploughs to the field, and sees every thing properly executed. He feeds the horses, has the charge of all work done by them, and of all the implements which appertain to that department.

The second head servant is Ralph Howard, who is a thorough judge of live stock. He has the charge of the whole sheep and cattle kept on the farm, and attends markets either for buying or selling. He has six herds and feeders below him.

The third head servant is John Fairbairn, who superintends the stacking, thrashing, and dighting of the corn; also the stoning of grass land, weeding the corn fields, gathering quickens, &c. from the fallows, &c. &c. He has four men and five women constantly under his charge, and occasionally a greater number of the latter as may be called for by the work to be executed. Draugh's are often made from my *corps* to assist him, especially when the thrashing machine is employed.

The fourth head servant is the clerk, whose work is the easiest in one sense, but most fatiguing in another. He writes out the orders,—posts the books,—rides upon business,—receives money,—and pays it away as ordered. Every night he gets reports from the other head servants; and upon Saturday, settles accounts for the past week with Mr. Jamieson.

The fifth head servant is your humble servant, and the nature of his office is already explained.

You would be surprised, notwithstanding the number of people employed, and the multiplicity of business executed, to see in what order and method every thing goes forward. In fact, every headsman may be considered as a separate farmer; with this beneficial difference, that his attention is in a great measure directed only to one object; whereas, in ordinary cases, the attention of a farmer must be displayed upon multifarious articles of business, some of which, of course, stand a chance of being neglected. Mr. Jamieson insists, in the most pointed way, that none of us shall interfere with the business of his neighbor, or even go near each other during work hours, unless when directed by him. He maintains that these rules are not only necessary to support good government, but even to preserve unanimity amongst ourselves. I believe he is in the right, and shall walk accordingly.

Elliot is always first up in the morning, having his horses to feed; and rings a bell placed on the top of the granary, which summons his men to the stables to feed and dress the horses; after which breakfast is taken. In the mean time, he goes to the office, and receives orders for the day, with which he instantly returns, and distributes among his ploughmen. In good weather this is an easy task, because the whole are usually kept together; but, in bad weather, the scene is changed, and a greater division of orders becomes necessary. Howard, after receiving his orders, goes to his herds and turnip-feeders in the byres; Fairbairn to his barns; and me to my old fellows, who assemble in a shade adjoining to the house, where their implements are deposited. Mr. Jamieson goes where he pleases, and superintends the whole.

At night, after work is over, we go to the clerk's office, and give in our reports, which are entered in the journal for Mr. Jamieson's inspection, who, from these vouchers, and obsevations made by himself, determines upon the orders for next day. When money is wanted,—as every headsman pays the people employed in his department—we make out an account, which is shown to Mr. Jamieson. If he is pleased to order payment, the pencil mark of "*pay*" is affixed, and we go to the clerk who takes our receipt at the foot of the account, and delivers the sum wanted. These accouuts are kept by the clerk till Saturday evening, when Mr. Jamieson takes them off his hand. By attending to these methods of carrying on business, I am bold enough to say, that the affairs of this farm are regularly conducted, and with much less bustle and confusion than on farms not a sixth part so large, where order and precision are neglected. You will be well pleased with these particulars, being a lover of regularity, and a keen friend to systematic arrangement in executing every kind of business.

March 4. Mr. Jamieson desired me to take a walk with him this forenoon, which I did with much pleasure. We went to a field where Elliot was drilling beans, his whole eighteen ploughs and six drill barrows being employed; and a noble sight they made. 'Elliot,' says Mr. Jamieson, 'have we a prospect of obtaining a good crop here? 'In my opinion,' replied Elliot, 'we have a fair chance of it; the land is rich and clean; and if the season is not against us, eight or ten bolls per acre may be expected.' 'Pray, Mr. Jamieson,' I said, 'how many beans will you sow here?' for I could hardly see to the end of the field. To which he replied, 'There were just one hundred acres in the break, which may require from 130 to 140 bolls of seed.' 'And what time may it take to plough and sow the whole of that quantity;' 'Elliot' says Mr. Jamieson, 'how long have you been here?' 'Why, Sir, two days before this one; and I am tolerably certain that in three days more, if you allow the whole strength to continue, we shall have the field finished.' As this was nearly an acre per plough per day I expressed some amazement at the quantity of work executed; but Elliot said, that a pair of good horses with a light furrow, such as should be given to covering beans, were unprofitably employed, if they did not turn over an acre per day, at two journeys of four hours and a half each. So much for the despatch given to business at this place.

We went from the bean field to the land intended for oats, which Mr. Jamieson thought to be in good condition for receiving the harrow; and added, that the moment his bean seed was over, he would strain every nerve to get his oats deposited in the ground as speedily as possible. He informed me that his earliest oats, though often of least bulk, were always more prolific than those latter sown, and that a day at this season was of incalculable value. Here ended our walk; and I went to a detachment of my old fellows, employed at turning a compost midden, the remainder being with Elliot wheeling his bean drills.

Howard tells me, that he has got a few lambs, and expects, ten or twelve score more, before eight days are over. The ewes, I notice, have got a supply of turnips lately on their pastures, which Mr. Jamieson assures me, is absolutely necessary at this season, if good lambs are to be reared. It is the New Leicester or Bakewell sort of sheep that are chiefly kept here, and they are quiet and docile in disposition, beyond any sheep that hitherto have come under my observation.

March 20.—Our oat-seed is finished this day; and when I tell you that three hundred acres have been sown, you will allow that no idle bread has been consumed, either by men or horses. I noticed that thirty-six harrows were employed, and learn from Elliot, that above thirty acres were, on an average, finished in each day, a good part of it having to get four double times of the harrows. He added, that when grass land is not very tender,

he makes it a rule to go over it two times in length, before he drives the harrows across; and this is done so as the furrows may not be pulled back, and the sward brought into its original position, which hurts the crop exceedingly. I understand that about one half of the early varieties are sown, and the other half of the kinds called Angus and Blainslies. I ventured to inquire at Mr. Jamieson which of the sorts were most profitable; and he was so good as to inform me, that both had their properties, though as the early ones generally yielded the greatest quantity of grain, he was partial to them; but that as the others produced most fodder, which was an important object with him, he was led to sow them in equal proportions; and that, in this way, his harvest work was divided, and much hurry and hazard avoided at that period. This, to be sure, is a matter of importance, therefore deservedly viewed in that light by so celebrated a husbandman.

Our turnip-fed sheep are all gone off; and the field which carried turnips forthwith to be cleared, and the remainder of the crop brought home, so as the ploughs may be entered preparatory to the sowing of barley. It seems that the charge of topping, tailing, and building of the turnips, is to be entrusted to me, and of course that my squad is to be employed in these operations. Howard informs me, that about thirty of the turnip cattle are still on hand, and that these, and the stock of ewes, will consume all the turnips that remain; though, he adds, that they are losing their nutritive quality very fast. Mr. Jamieson continues to favor me with his approbation; and my fellow servants, particularly Elliot, have shown a steady desire to give me every manner of assistance, In a word, my time here is not only usefully but agreeable spent, and I thank you once more for placing me at such a school.

April 8.—The barley after turnips is at last sown, though the work gave Elliot more trouble than he expected. Owing to a sudden drought, the ground turned up with a *heel*, as he called it; so a cross-ploughing was first given; then, after harrowing it, rollers were applied; and finally an ebb seed furrow; when it was sown with early barley and grass seeds. The field looks well to the eye, being finished in a most husbandman-like style; but upon talking to Elliot concerning it, he shook his head, and said, he seldom saw good barley after turnips, when the land required to be *forced*; and that he will pawn his word that we have better barley upon the break that carried beans last year, which he is forthwith to seed-furrow. He says that he means to sow this field *green*, or after the plough, and not allow it to spire and lose brairding sap. The field to be sure is clean, and perfectly free of quickens; so I dare say the method meant to be taken is a good one. Fairbairn and his women, for several days, have been gathering stones on the break of clover intended for cutting; and my *corps* have digged a number of drains in the adjoining field intended for summer-fallow, into which the stones are deposited. Three carts are employed to drive the stones, which are instantly put into the drains; and while Fairbairn superintends the gathering process, the task of filling in and covering up, is committed to your humble servant. We work five hours in the forenoon, and four in the afternoon, and go merrily forward.

Class 2nd.

May 9. My residence with Mr. Jamieson continues to furnish me with instruction in every branch of rural work; and nothing has occurred to obstruct or lessen the enjoyment repeatedly expressed in my former letters. My master is kind and communicative. My fellow servants join in promoting his views to improve and instruct me; and hitherto the slightest difference has not taken place betwixt me and any of the numerous body of people belonging to this extensive and well regulated undertaking.

Yesterday Mr. Jamieson desired me to accompany him in his ride to examine the winter sown wheats. The break of one hundred acres, after summer fallow, upon which grass seeds were lately sown, looked astonishingly well. It had been thinly seeded, a practice Mr. Jamieson is fond of upon well prepared ground, and was tillering or stooling with the greatest vigor. The ear is already fully formed; though Mr. Jamieson says it will not come out of the *shot blade* in less than a month. He added, that smut or black may be observed in this early stage,—though after the most attentive investigation the smallest sign of that abominable disorder could not be discovered.

The field of wheat after beans appears to be considerably thicker seeded than the one after fallow; and the reason assigned by Mr. Jamieson for the difference was, that upon a bean stubble, the plants rarely gather so freely as those upon a well wrought fallow fresh impregnated by manure. I noticed, however, that this field was green and thriving—that the blade was broad, and in most places twisted something like a screw. The soil is a heavy loam, which Mr. Jamieson says is better calculated for carrying superior crops, both as to quantity and quality, than of the other varieties.

Our lambs were handled last week, and proved to the satisfaction of the butcher. He marked one hundred that are to be removed to-morrow. I think Howard said that twenty score were sold, and that the remainder are to be weaned and *hogged*. They are going with their dams upon rich grass; and also received ruta baga till about the middle of April.

Elliot has got all the turnip land cross-ploughed, and is now employed at the summer-fallow. He has already run over some of the bean land with the scraper or Dutch horse-hoe, and has set apart eight horses, and the like number of men, for ploughing and cleaning the bean and turnip crops of this year. The best and steadiest hands are selected for this purpose, as it requires dexterity and attention. Of this husbandry, Mr. Jamieson has promised me a full description at a leisure hour. My *corps* have of late been much employed in scouring ditches and cleaning hedges, on which matters Mr. Jamieson bestows much attention. They are thinned a little by a draft of four to Elliot for his bean ploughs; and these were men who had been in habits of receiving similar employment in former seasons.

May 15. Hitherto I have said nothing about Mr. Jamieson's thrashing machine, therefore shall now communicate some particulars concerning that noble implement, imparted by my friend Fairbairn, to whom the sole direction and superintendence of it is entrusted. The machine is

wrought generally by water, but has a six-horse impelling power also added, which prevents inconvenience in the driest season; though, except in the summer months, and sometimes in autumn, a full supply of water is rarely wanting. The outer wheel is large, and placed on a gentle declivity, affording the impelling power its full weight, and throwing off the water cleverly, without hanging on or obstructing the velocity of the wheel by remaining in the tail dam. The barn or house in which the corn is thrashed is of great dimensions, being fifty feet in length, twenty-four in breadth, and twenty feet in height of side-walls above the lower floor, which gives a large stowage for thrashing corn and offal, till time is allowed for cleaning the whole by hand-fanners for the market. This is a convenience, I am told, too much neglected in all the original houses; and owing to the want of it, thrashing must often be given up, till the offal or *broke* is arranged and put in less bulk. I am informed that with wind machines, the want of barn room has been found a serious disadvantage, as often the impelling power is lost before matters can be put in order for using it. But to return from this digression. The drum of Mr. Jamieson's machine is three feet in diameter, five feet in length, armed with four scutchers or beaters, and moves with the velocity of 2400 feet per minute. To work this machine in a complete style, two men are required to feed the rollers; three girls or boys to open the sheaves, and hand them to the thrashing board; the same number of women to riddle the grain in the under apartment, and four men to remove and stack the straw. Generally a woman also is employed to clean the chaff-house and keep the offal in order. The corn is brought to the barn as wanted, by two one-horse carts closely boarded. These usually have full employment; and as a man is required to cast or take down the stack, altogether sixteen hands and two horses are employed; though, in point of fact, the wages of two men and three girls can only be charged against the machine, because the work of the others would have been equally called for, had the grain been thrashed in the old way by flails.

The saving to the owner, when such machines are employed, must, even in the first instance, be considerable; and, when the perfect way in which the grain is separated from the straw is taken into account, perhaps it may be equal to one-fifth or one-sixth of the gross produce. Fairbairn maintains that the saving is greatest upon wheat, which formerly, when hand flails were used, was with every attention seldom thrashed clean, especially in cold raw seasons. He adds, that one hundred bolls, or fifty quarters of wheat may be thrashed in a day of eight hours, unless the grain has been sloomed or mildewed; and that with oats a still greater quantity may be turned out. As the machine is provided with two pair of fanners, the grain is, in many cases, fit for market after being once riddled; but the usual custom is to run it again through hand fanners, Mr. Jamieson being very nice in the dressing of his grain that is to be marketed.

May 20. Yesterday and to day ten acres of the turnip break were sown with ruta baga or Swedish turnip for late spring food. The heaviest part of the break was selected for this purpose, Mr. Jamieson being of opinion, that a strong loam, if incumbent on a dry bottom, is better calculated for ruta baga than lighter soils. The ground, had got three ploughings, was harrowed, rolled and hand picked, till it was perfectly reduced, and free of root weeds, when it was formed into drills with 27-inch intervals by a bout of the plough. Into the interval of these drills plenty of dung was deposited, (Mr. Jamieson says that ruta baga requires almost double the quantity of dung that is sufficient for common turnips); after which the drills were split, and the dung completely covered, when the seed-barrow was run upon the top, which finished the operation.

Mr. Jamieson mentioned two particulars which deserve attention when ruta baga is sown. 1*st*, That, in forming drills, the plough ought to go deeper than when common turnips are intended, so as a proper bed may be made for the extra quantity of dung given, otherwise it will not be sufficiently covered. 2*dly*, That early sowing is advantageous, so as the root may have time to arrive at maturity. He added, that ruta baga is a dull growing plant, making slow progress in its passage; and that, if the field yellow turnip maintain its character, he is not sure but he will abandon the culture of ruta baga altogether.

The remainder of the break intended for turnips (90 acres) is in a forward state of preparation, and is now harrowed down so procure the vegetation of annual weeds. The plain summer-fallow break is cross-ploughed, and receiving the full advantage of the present dry weather. I presume it will lie in this state till the seed is over; through Elliot says, if a shower comes soon, he will give it a trimming with his harrows, so as the root weeds may be loosened, and the growth of annuals forwarded. My squad, now reduced to six men, are turning dunghills from morning to night, except when detached for incidental purposes.

May 27. Mr. Jamieson has just furnished me with a circumstantial detail of his bean husbandry; some particulars of which must be interesting to you. According to his mode of cropping, this plant generally follows oats after grass, when the land may be supposed to be in good condition. He first begins by giving it a cross furrow, which is taken as deep as the soil will allow. The field is then completely water-furrowed; the end furrows and *gaw*-furrows being digged with the spade, in which situation it is left for the winter. The moment that the ground can be worked in the spring he harrows it according to circumstances, but never breaks down too much at once, in case a change of weather should ensue. The ploughs are then entered, and one drill-barrow allotted to every three ploughs. By taking a nine-inch furrow, and running the barrow after the third plough, an interval betwixt the rows of 27 inches is left; and such an interval he thinks fully adequate for admitting horse-hoes of every description. About fourteen days after sowing, the ground is harrowed and water-furrowed; and in this state it remains till the young plants are fairly above the surface, when the Dutch hoe or scraper is employed, as formerly mentioned.

This is the mode of planting beans hitherto exercised by Mr. Jamieson, but he has it in contemplation to change it in an essential branch, which, in favorable seasons, must undoubtedly be beneficial. Instead of sowing with the first spring-furrow, which, being taken ebb, does little more than cover the seed, he means to give the

ground a second deep ploughing in a contrary direction to the first one, afterwards to harrow it, and then to form drills of the same wideness, either by a single furrow or a bout of the plough. In the intervals of these furrows he will run the barrow, after which the drills will be slit out as in the turnip husbandry, and the seed covered. At a suitable time afterwards, the harrows will be drawn across, and the ground levelled, preparatory to the cleaning process,

It occurred to me, that the time consumed in slitting out the drills may be saved, were the harrow drove across when the beans are sown; but Mr. Jamieson obviated this remark, by saying, that a flush of annuals was to be dreaded in such a case; whereas, by delaying the harrowing two or three weeks, the first crop of weeds would in a great measure be thereby destroyed. The only objection which remains to the plan is, that in some seasons seed-work may be so long delayed as to prove injurious to the crop. In every other respect, the proposed change must be attended with important advantages.

We have had a few changes of servants at this term, chiefly with those not reckoned the best hands, or with whom Mr. Jamieson was dissatisfied. Indeed, it would appear that he possesses such happy knack of managing his people with judgment and dexterity, and at the same time pays them so handsomely, that servants worth the keeping rarely leave him. It is a mark of a good farmer, to regulate his different operations according to the nature of the soil in his possession; and in like manner, a man of prudence and sagacity will at all times govern and direct those below him, according to their different tempers and capacities.

June 3. The portion of land intended for yellow turnips is now seeded; and the several processes were precisely similar to those already described when the ruta baga was sown, only that a smaller quantity of dung was given. Elliot informs me, that this variety has been cultivated here for two years past, and that it stands the frost nearly as well as ruta baga. He added, that it is not so shy of growing, and may be obtained on soils where the other would not live. About five acres of horse potatoes, or yams, were also planted, chiefly for swine food, or as a supply to the cattle when turnips are wanting. This may sometimes happen in a stormy day; and Mr. Jamieson takes care to be provided at all hands, so as his bestial may not suffer.

At Mr. Jamieson's desire, I accompanied Elliot a few days ago through the bean fields. They have all been once run over with the Dutch hoe, and now the small turnip ploughs are employed to lay away the earth from the sides of the plants, and to form a fresh ridge in the centre of the interval, which will afterwards be separated and divided by a second application of the Dutch hoe. The whole formed a pleasant sight, being in superior order to the most of garden culture. The oat-fields are looking well; indeed every thing on the farm has a most thriving appearance.

Last week the horses were put upon green food, and two feeds of oats per day, which I learn is the practice here, till the turnip sowing is over, when they are limited to one feed. One of my men is employed to cut the grass, and another ties it up in bunches of 28 lbs. avoidupois weight, four of which are given to each horse per day. Twenty cattle that got ruta baga in April and May, are also carried on with clover given them at the stake, and they seem to be thriving well. It takes a man and two horses to bring home the grass, as the field is about half a mile from the homestead. The feeding of the cattle is in Howard's department; but the charge of superintending the cutting and tying the grass is with me. I often take the scythe by way of amusement, though it is rather heavy work for one of my age. Mr Jamieson is very pointed in having the grass cut equally and close by the ground, and says, the lower it is cut at this time, so much the faster and stronger will the second crop grow afterwards.

June 10. All hands are employed about the turnip-seed work, and what with ploughs, harrows, rollers, drills and carts, and the fillers and spreaders of dung, a jovial number is upon the field; but I must describe things in order, otherwise you will not comprehend the nature of our operations sufficiently.

The extent of the field remaining for common turnip is seventy-five acres or thereby. It had been ploughed four times over, and after each furrow immediately harrowed and rolled, so as moisture might be retained. Some parts, which were rather rough and cloddy, required a repetition of these operations; and this was performed by four harrows and one roller, drawn by two horses. This left thirty-eight horses for ploughing, carting and sowing; and these were arranged in the following order.

First, Eight ploughs and sixteen horses for forming and reversing the drills, so as the dung might be covered. *2nd*, Six carts and twelve horses to drive out the dung, which was middened as carried out in winter, adjoining to the field. *3d*, Two drills, each drawn by one horse, and sowing two rows at a time. This was the nearest division of the strength that could be made, and hitherto matters have proceded with regularity. Elliot looks after the ploughs and drills; Fairbairn the spreaders; and the loading of the carts is under my superintendence.

It is a principal object with Mr. Jamieson to have the drill formed, dunged, slit out and sown, as rapidly as possible, so as moisture, the soul of vegetation, may be preserved, upon which he says every thing depends; of course, these operations follow each other in the quickest manner. How soon that five drills were formed, which was done by a bout of a plough to each, the carts entered; and the dung being laid in small heaps, was instantly separated by ten spreaders, who were divided into two gangs under the immediate direction of Fairbairn. Four of the ploughs were then set to work in splitting out the drills, and were followed by the seed-barrows, while the other four ploughs proceeded in forming or making up fresh drills. The carts rather pressed upon the ploughs,—though, by going at a long step, no obstruction occurred. Indeed, Mr. Jamieson had, with his usual attention, selected the strongest horses and most active ploughmen for this department of the work. The carts were also divided into two heads, each having two of my squad to fill; the remainder were lent to Fairbairn, who had his corps of spreaders made up with some of Howard's people; a steady man was appointed for drawing out the dung to each head of carts,

which Mr. Jamieson considers to be necessary, if you wish the land equally dunged. Altogether, there were in the field 35 men, besides Elliot, Fairbairn, and me. I might have included Mr. Jamieson, who did not leave us for an instant, but rode about the field from the beginning of each yoking to its conclusion, except when at breakfast. Elliot thinks that seven acres were finished this day; and as the carts took out 112 loads, which was 17 to each cart, or 14 to the acre, I apprehend he is not far out in his calculation.

June 24. Turnip seed is now over, having from first to last been favored with excellent weather. The first sown drills, though the weather has been dry, fairly above ground,—entirely owing, as Mr. Jamieson declares, to the sedulous attention bestowed on securing the means of vegetation. As the several operations went on from first to last in an uniform train, I hope the whole will be equally successful, as the different departments of the work were nicely balanced. The seed used is all of the globe kind, raised on the farm, as Mr. Jamieson says he will never trust a seedsman for a supply, unless impelled by the most urgent necessity. The ruta baga and yellow turnip were likewise of his own produce; and with what he saved of these seeds many of his neighbors have also been supplied.

Fairbairn, with a large detachment of women and boys, is at this time going through the bean fields, pulling out every weed from the drills to which the plough had not access. The ruta baga is thinned and set out, and the yellow turnip follows. Fairbairn has about fifty hands, young and old, under him; and it is wonderful to see with what adroitness many of the boys *pull* and *shoot* the hoe, and how dexterously they set out the young plants. The hay harvest is also commenced; and six of my fellows are cutting away this day, and will continue, if the weather proves dry, till forty acres are laid on their back. Mr. Jamieson has enjoined me, in the most positive manner, not to allow a scythe to be drawn when the grass is wet, alleging that such a step would prove injurious to the quality of the hay. In the event of wetness, he has directed me to make the cutters turn an earth midden at the end of the grass field, to which lime shells were lately driven, so I cannot be at any loss, however the weather should turn out.

Elliot is giving the summer fallow break a third furrow, and driving lime shells to it. He first harrows the land, after being gathered up, and draws out the lime in heaps of a barley firlot, or a bushel and a half each. The ridges being 18 feet in breadth, have cross furrows drawn at the like distance, which makes them appear like a dam-board; and as a heap is drawn out into each square, any mistake in the application must be very trifling. Six carts are now employed at the lime, eight ploughs at ridging up the land, and eight horses at the beans, which are now receiving their last furrows; and, when finished, the horse-hoes go to the ruta baga and turnips. A cart continues to drive grass constantly; but the horses therein employed are a couple of odd ones, not included in the regular strength. Notwithstanding the immense number of hands employed, I assure you that there is work at this time for more, if they could be procured; but this being the busy season with every farmer, a temporary supply is not to be obtained.

July 8. The hay field is all cut, at least that part originally intended for dry food, though Mr. Jamieson says that probably a few acres more may be used in the same way, if not needed for the horses and cattle at the stake. This however, will not be determined on till the end of the month, by which time the tare field will be ready for cutting. Fairbairn had the charge of winning and cocking the hay. As the weather proved good, the processes were not difficult. It lay one day untouched after being cut; then was turned over; and in the afternoon of the same day, put up in small hand-cocks, four or five of which were afterwards put into a fork rick; and in this state the hay remains till fit for the stack-yard. The turnip field is at hand; so Fairbairn's squad wrought there in the mornings and at spare times, and was ready for hay work when called for. My men, not at the turnip ploughs and grass cutting, are attached to him so long as hay harvest lasts; and, of course, I am also under his direction.

The fallow break is now wholly ridged up, and about one third of it limed. I understand that one half of the break was limed at last fallow time; so the part that remains will soon be finished. The lime is to be spread the moment the hay is ricked, which is to be done by my people, not otherwise engaged, and some of Howard's men; of course, the superintendence will fall upon me. Mr. Jamieson says that he means to plough the lime into the ground with a shallow furrow, then to harrow and lay on the dung, and to conclude the process with a seed-furrow about the beginning of autumn.

It gives me pleasure to add, that Mr. Jamieson sent for me last night after working hours, and inquired concerning your welfare. After some other conversation, he kindly said, 'George when you write my good old friend your father, tell him that I am well satisfied with your behavior since you came under my management, and that I will do every thing in my power to serve you. Be assured, however, that success, in a great measure, depends upon yourself. If you remain steady, diligent and industrious, there need be small fears entertained; but should sloth, carelessness or irregularity prove master, the issue may easily be foretold. You have hitherto shown an anxious disposition to learn, and given proofs of your activity, Persevere then in those honest endeavors, avoiding idleness as the parent of vice, and vice as the source whence every human misery flows.'

(To be continued.)

ADVANTAGES OF THE THREE-SHIFT ROTATION. IMPROVEMENT IN WESTMORELAND.

To the Editor of the Farmers' Register.

The republication of my essay on *marine manures* in your 'Country Advertiser,' being likely to give additional currency to an erroneous opinion, therein expressed, in regard to the four-shift rotation, I deem it my duty to correct it, lest some inexperienced farmer misled by my authority may be induced to adopt a system, which subsequent experience will compel him to abandon. The late Mr. John Wickham was the first I believe to make known the fact which ought to have been obvious to every one—that the four-field rotation of lower James River, is a much more exhausting course than the much abused three-field system

common throughout the tide-water region of Virginia. Certain it is, that none but the richest soils, such as those of Shirley and Westover, on which the successful experiments of Messrs. Carter and Selden were made, can bear three grain crops in four years, without frequent and liberal supplies of enriching manures. I very soon discovered, after the publication of my essay, that the comparative poverty of our soils, (if there were no other objection to the system,) would preclude the profitable cultivation of our farms, or the four-field rotation of corn, wheat, clover, wheat, which I at that time intended to adopt. The less exhausting, but much less profitable four-field system of corn, wheat, clover, clover, has been adopted by some persons in this neighborhood. But to that, there are such obvious and weighty objections, (of which I shall mention but two,) that it must soon be abandoned. 1st. Corn is the great staple of eastern Virginia. It is the most certain and by far the most profitable crop; and as a general rule, the greatest profit cannot be realized with less than one-third of the arable land in corn. 2nd. The tide water farms are so prone to put up bushes of gum, locust, persimmon, &c. that to cleanse them for a crop, after they have been two years out of cultivation, requires so great an expenditure of labor, as to interfere seriously with the essential operations of manuring and draining, on which depend, almost exclusively the profits of agriculture.

I am now thoroughly satisfied, from my own experience and extensive observation, that the three-field system, of corn, wheat, or oats, and clover, properly pursued, is by far the most profitable course of farming in eastern Virginia. To make the system effective, there must be a standing pasture of marsh or wood-land, sufficient to sustain the farm stock until the month of June, when the clover is in full bloom. At this time the stock may be turned in, with the full assurance that you will have an abundant dairy, a full meat house, and a fine crop of corn succeeding the clover. The fields should be well and separately inclosed, and the hogs after harvest permitted to glean the wheat field, which should be studiously guarded from the encroachment of all other stock. By this means a full supply of fine pork for the use of the family and laborers, may be secured at a very trifling expense.

Manure is the basis of this, as of every other system of successful husbandry. The field for corn should be thoroughly manured. If this cannot be entirely accomplished, it may at least be very nearly effected on tide water, where *marine manures* are inexhaustible. On farms farther removed from the water, where these manures are not to be procured, substitutes may be found in marl, leaves from the woods, and a compost of lime, leaves, earth, &c. which may be made in great quantity by having a permanent cow-pen liberally supplied with earth, lime and leaves, throughout the summer. I have for several years made this compost in considerable quantity, and used it with great effect, on the forest farm on which I reside. Several of my neighbors also have pursued the same course with very decided success.

There is no portion of the state, known to me, in which agricultural improvement has advanced so rapidly, as it has done in this immediate neighborhood, within the last ten years. In that period the crops it is believed, have been at least doubled, the value of lands greatly increased, and the wealth and comforts of the people vastly augmented. These inestimable benefits may be justly attributed to the enlightened zeal that now animates our farmers, and to the liberal and judicious application of manures common to the whole tide water region, and within the reach of all who have the industry to apply them. But those improvements, great as they are, I am well convinced are yet in their infancy; and the most sanguine cannot now foretell the glorious results that must ensue, from the continued and persevering application of the various resources, with which a wise and bountiful providence has so abundantly blessed us.

WILLOUGHBY NEWTON.

Westmoreland, Va., Aug. 29th, 1839.

PRACTICAL TREATMENT OF BEES.

From the Edinburgh Encyclopædia.

We have thus traced the natural history of the honey bee from its origin until attaining perfection, and shown how the various species form one great colony, where labors are carried on for the common good. We have explained also, that, at a certain season, bees desert their habitation in quest of another, which, in a domesticated state, the cultivator is careful to provide; and we shall now proceed to the practical treatment of bees, and point out how their labors are to be converted to utility, profit, and pleasure.

All the circumstances above related having taken place, the new swarm is lodged in a hive, there to commence the collection of honey, the fabrication of wax, and the perpetuation of the species. Much has been said of the fittest size and figure of a hive, and of the substance of which it should consist: wood, straw, and oziers, have all been recommended; and round, square, oblong, and hexagonal hives have had their particular partisans. These things, we apprehend, do not merit the importance bestowed upon them; and our reason for saying so is, from having seen the most ample products of honey, under conditions almost diametrically opposite. At one time we have seen large straw hives, of the ordinary fashion in this country, full to the brim of rich honey-comb; at other times we have seen them almost empty, without any sensible cause, and where circumstances seemed to favor the reverse. We are thence induced to conclude, that less depends on the shape and capacity of the hive, than on the kind and quantity of the swarm introduced into it, and on the season in which their collections are made. Examples have come under our notice, where a swarm, lodging in the roof of a house, has produced a great quantity of honey in combs only four or five inches broad: another swarm also in the roof of a house we have known to fill combs above eighteen inches in breadth. Exposure to the north or south has not affected the bees: their provision has been equally abundant. And here we may remark, that in all instances that have fallen within the sphere of our observation, the products of swarms, lodged in the roofs of houses, have invariably been abundant. We do not pretend to account for this. Perhaps it may partly result from their labors being performed

without any disturbance or interruption; partly from the greater heat preserved in a roof during summer. Heat is the soul of insects: their action and exertion are directly in proportion to the temperature of the atmosphere; and cold is the bane of their existence. It is not unlikely, also, that the same cause promoting the hatching of the brood, contributes to render the colony more numerous: and if their swarming is at all dependant on want of room, large portions of them have not an equal inducement to seek another dwelling. Pallas tells us, that the Russian peasants, in remote parts of the empire, hollow out a part of the trunks of trees, 25 or 30 feet from the surface of the earth, for the purpose of hives, and coverthe opening with planks, leaving small apertures for the bees. At Cazan, Mr. Bell saw hives of a similar form, which the inhabitants bound to the trees at the side of a wood, in order to secure them from the bears.

As abundant collections of honey are often made in the common straw hives, we cannot affirm that they are unsuitable for the purpose; but they are attended with the disadvantage of preventing the owner from an early appropriation of the labor of the bees. One convenience, indeed, lies in the facility of construction, which always merits due appreciation in every branch of rural economy; and, also, that the cost is inconsiderable. Though neither the size nor figure of the hive be important, all modern cultivators seem agreed that it should be susceptible of additions. In the ordinary straw hive, the addition is made by raising it on a circular ring or hoop, either of wood or of the same materials; a clumsy and awkward expedient, which commonly leads the bees to waste much of their labor in filling up crevices. Notwithstanding this, it is adopted in Brittany with some little difference, and there called the *Scotch hive*. The hive itself consists of two pieces, each twelve inches wide, and eleven high, made of rolls of straw. The under one is divided from the other; but a communication hole, fifteen or eighteen lines in diameter, is left for the bees. As they work downwards, the under part, which is nothing but one of our common *eeks*, or broad hoops, is next filled. Pyramidal hives have been made several feet in height, and divided into different stages, or compartments; which the bees, after being lodged in the highest, would successively fill on removal of the floors or stages. Boxes of convenient size and form, placed above each other, have likewise been recommended, and which we should suppose well adapted for enabling the cultivator, at all times, to take the honey with ease. Such boxes are made of well seasoned wood, nine inches long, the same in breadth, and eight inches high; but from what we have said, there is no necessity for a rigid adherence to these dimensions. In the roof there is a communication hole three inches square, on which is placed another box of similar structure; others may be raised above this to an indefinite height; and the bottom of each is open like the mouth of a common hive. When a swarm is lodged in a box, if only two be used, it is immediately to be put over an empty one, as the bees must have more room; and if more than two are used, a new one is successively to be supplied below. The bees, beginning from above, will soon fill the upper box with honey; and it is to be then separated from that beneath it, by drawing through a long thin pliable knife, to cut the comb. The communication hole of the lower box must then be covered with a board, and the box separated carried to a distance, where the bees remaining in it may be dislodged, by turning it up and rapping on its sides with a small stick. The proper time to perform this operation is at sunrise. Collateral boxes have also been suggested, from the belief of their being attended with greater advantages to the bees. The size is nearly the same with that above mentioned. There is a communication hole in the side, and an opening low and wide below in the sides applied to each other, to allow the bees more ready passage. Collateral hoops of twisted straw or wood were long ago invented, by which means the inventor enlarged his hives to an unlimited extent; and these he kept, with great advantage, in a garret near the roof of his house. Madame Vicat invented a kind of hive, composed of hollow frames of three sides, which are connected together, and can be separately taken out at pleasure. Each frame is made of three pieces of plank, half an inch thick. The two side pieces are eleven inches high, and five and a half broad; the piece connecting them above is seven inches long, and they are ten inches asunder at the bottom. The sides of these open frames are applied to each other, and if one of the four be taken away, an empty one can be introduced, or the remaining ones can be closed together. Somewhat analogous to this is the *leaf* or *book hive*, invented by M. Huber, some of which construction have recently been adopted in Scotland, after the description he gives of it. This consists of twelve hollow frames, twelve inches high, nine or ten in breadth, and fifteen lines in width, as it is intended each shall receive only a single comb. These twelve frames, laterally applied to each other, form the whole hive. All are connected by means of hinges at the back, so that they divide asunder in opening like turning over the leaves of a book. The ten intermediate frames, between the first and twelfth, are hollow; the outside of these two are covered; in them, also, is an entrance for the bees; there should be one in all the rest, to open at pleasure. On first lodging a swarm in one of these hives, a small piece of comb should be fixed in a division, to guide the direction of those built by the bees, which will be parallel to it; and as each frame contains but a single comb, it is extremely well adapted for observation, and it also admits the removal of that comb without affecting or deranging the rest. The whole contents are exposed to view, the queen is easily found, and whatever should be removed or altered can be selected with great convenience. The inventor conceives, that the book hive has the property of rendering the bees more tractable; for on opening any of the divisions, the bees rather testify fear than anger, by retiring into the cells as if to conceal themselves. This he ascribes to the effect which the sudden introduction of light has on them; for they are less tractable after sun-set and during night than through the day. The divisions must be separated slowly, and care observed to avoid wounding the bees. If they cluster too much on the combs, they must be brushed off with a feather, and breathing on them cautiously guarded against. The air which we expire seems to excite their fury; and it certainly possesses

some irritating quality, for if bellows be used, the bees are more disposed to escape than to sting. Another advantage attends the leaf hive, which consists in the power of the operator to make the bees work in wax, or, which is the same thing, to construct new combs. All that is here required is to separate those already built so far asunder as to leave an interval in which additional ones may be constructed. Suppose that a swarm be lodged in a leaf hive consisting of six divisions, each containing a comb. If the young queen be as fertile as she ought, the bees will be very active in their labors, and disposed to make great collections in wax. To induce them towards it, an empty frame, or division, should be placed between two others, each containing a comb. From the necessity which nature has imposed on these insects of never leaving more than four lines between their combs, they will soon begin to build a new one in the empty space, which will be parallel to the others. The number of vacancies left may be proportioned to the strength of the swarm, and the goodness of the season; but they should not be forced too much to work in wax. M. Feburier, the most recent observer on this subject, and who, we believe, is just about to publish a work regarding it in Paris, has recommended a hive to the National Institute of a quadrangular pyramidal figure, with moveable sides. Its principles are said to be founded on those of M. Schirach and Huber; but, as yet, they are not sufficiently detailed to enable us to to explain them. If wood be used, it must be extremely well seasoned, and perhaps covered with some thin varnish on the outside, else it is apt to decay. Sir Torbern Bergman ascribes the scarcity of bees in Sweden principally to employing wooden hives.

Those who are anxious to view the various and progressive operations of bees, may gratify themselves, by procuring hives with glass sides. This can hardly be denominated a modern invention, as Pliny records, that a Roman senator had something of the same kind, made of the thinnest and most transparent horn. But those entirely made of glass were not known on the continent before the year 1680, though they were made with panes in England early in the same century; and hives made completely of glass are spoken of in 1655. Glass hives ought not to be round, like the common shape, as the bees are concealed among the combs; they should be square boxes, whose sides consist of four panes. Reaumur used them so thin as to admit of no more than two combs being constructed, that he might the better witness the procedure of the inhabitants. A pane on each side of Huber's hollow frames exposes both sides of the comb. Such hives must be covered with a wooden box, or an opaque substance, as light disturbs the operations of bees.

Some authors think that there is greater hazard in giving bees too much than too little room to work, when first lodged in a hive, as their animal heat will not be sufficiently confined. However this may be, they ought afterwards to enjoy enough of space; for we are satisfied that many swarms are injured from wanting it.

Nothing is of greater importance than the size of the swarm lodged in a hive. We repeatedly see large swarms succeed, while small ones, especially towards the end of the season, fail. The bees, therefore, in each swarm should be extremely numerous; and we may confidently affirm, that the cultivator will find much of his success depend on the number of workers contained in a single hive. It appears, that bees are discouraged by the smallness of their own numbers; that, when greatly reduced, their instinct is affected, they labor with less activity, they cease to keep guard at the entrance of their hive, and testify more indifference for their own fate and that of their young. Whether the advantage lies in a numerous swarm making greater collections in a shorter time; in augmenting the temperature of the hive; or in the different internal functions having larger classes of workers to perform them, we shall not attempt to decide. We therefore recommend the junction of two or more swarms into one, particularly when the period of collection draws towards a close, and the sacrifice of their supernumerary queens. By this expedient it will be seen, that while each could hardly subsist itself, and lay up provision for winter, they will be enabled to survive during its most rigorous cold; and, if the operation be performed earlier in summer, they will gather ample stores. Practical directions have been given for the exact weight which a good swarm should amount to. Bonner says, a swarm is very good if it weigh four pounds; and Butler maintains, that "the goodness or greatness of a swarm you may most certainly know by the weight: it being a good one that weigheth five pounds; a reasonable good one that weigheth four; and a very good one that weigheth six." But the number of bees in a pound is very far from being ascertained, which must restrain us from pronouncing on the exact weight that should constitute a good swarm. Thorley, whose work on bees participates of many of those absurdities in which most authors on this subject have allowed themselves to indulge, observes, "In October 1743, when putting the bees of a small late swarm into an empty hive, and afterwards upon a table, I took a particular account of their measure, weight, and number: in measure a quart; in weight one pound and a quarter; in number two thousand." And he concludes, that the number of bees in a swarm weighing four or five pounds would be 8000, or upwards; whence a suitable hive for 8000 or 10,000 bees should be equivalent to two pecks and a half, or three pecks, in capacity. The calculations of M. de Reaumur produce a very different result. A very fine swarm which left one of his hives he estimated to consist of 43,000 bees, and weighed eight pounds. Thus there are, according to him, 5376 in a pound of 16 ounces; and Butler, who, in spite of all the extravagancies of his work, certainly made some accurate observations, estimates the number of bees in a pound at four thousand four hundred and fifty. We suspect, that both he and Reaumur have overrated the number.

The situation and arrangement of the apiary, claim the cultivator's attention. Each hive should stand on a wooden sole, or rest, supported on a single wooden post driven into the ground, or on three close together, near the centre of the board, that the enemies of the colony may have difficulty in crawling up from below. It should be fixed securely, so as to escape being overturned by the wind; but the common custom of laying a turf on the top must be avoided, on account of the harbor it affords to noxious insects. Hives should

stand far apart; if there are six hives in one portion or division of the apiary, they should not be less than nine or twelve feet asunder. But too great a number never should be situated in the same district. The collections of bees are drawn solely from flowers, and perhaps, in some small measure, from honey dew, which at times appears on leaves, and is said to produce an inferior honey; it is therefore evident, that immense quantities of bees, actively employed, would not be long in exhausting the whole. The number of hives should, therefore, be regulated by the situation of the apiary. A district abounding with flowers and blossoms will admit of more than one where the chief product is grain. An apiary ought to stand in a quiet sheltered place, where the bees may perform their labors totally undisturbed: flowers, particularly those most fruitful in honey, should be copiously disseminated around; and, for the facility of saving swarms, it is better to have low flowering shrubs in the vicinity than lofty trees. Means should be practised to obtain a succession of flowers in successive seasons, that the bees may always have the collection of honey in their power, and without going to a distance. It is not known how far they fly; some think they traverse several miles; others, that their flight hardly exceeds half a league; but the accidents to which they are exposed render it important for provisions to be near at hand. In the low country, mignonette is said to afford the finest honey, and may be kept in blossom a large portion of the year. Bromwich, an intelligent writer, relates, that, in 1779, he planted a great quantity of it before two bee hives, at a considerable distance from any other bees. With such abundant supplies as this afforded them, few ever left his garden. In September he took the honey, and found it exceeded, by above a third, what he obtained from any other two of his best hives, where the bees were obliged to fly farther; and equal in fragrance and color to what is imported from the warmer climates. It is a favorite flower among bees; for we have observed patches of it, in the very centre of the city of Edinburgh, resorted to from hives beyond the suburbs. Bonner affirms, that he has often "seen a hive, by being placed nigh heath, become ten, twelve, or fifteen pounds heavier in the month of August; whereas, if it had remained in its original early situation, it would probably have become every day lighter after Lammas."

This circumstance leads us to another point which the cultivator has to observe, namely, changing the situation of his apiary as the flowers surrounding it decrease. Those in one district, as we well know, have entirely faded, while those of another are in full blow. Though the practice of transporting hives to fresh pasturage is not so general as it ought to be, probably because they are seldom numerous in the possession of individuals, it is not unknown in Scotland; and persons in the vicinity of Edinburgh yearly send their whole stock to the Highlands, for the purpose of gathering honey. In France it is done either by land or water. M. Reaumur mentions the custom of a M. Protaut, who cultivated bees on an extensive scale, and seems to have kept between 500 and 600 hives for a manufactory of wax. These he sent twenty miles from their ordinary station, and, if the place appropriated for them was not productive of food, they were transported still farther. Each hive was put on a coarse cloth, the corners and edges of which were turned up, and secured by binding them round with packthread. Those containing small quantities of comb were kept in the usual position; but those full of comb were reversed, in order to secure the comb. They were then disposed in tiers, two and two, throughout the whole length of carts made on purpose, from 30 to 48 being carried in each cart. The carts travelled slowly over the smoothest road when the journey was long: if the hives were slenderly stored, they sometimes halted near fertile fields, and the bees were allowed to go abroad to feed; having returned at night to their dwelling, the journey was resumed. The Egyptians also transport their bees on a large scale on the river Nile. The inhabitants of lower Egypt collect the hives belonging to different villages, and pile them up in pyramids in boats prepared to receive them. These boats slowly ascend the river, as in higher Egypt the flowers are earlier in bloom; and they stop on the way, to allow the bees to fly about and make ample collections on the banks. Three months are occupied in the voyage and return, when each hive is delivered to its proprietor, whose name, mark, or number has been affixed to it. The modern Greeks, inhabiting the coast of Asia Minor, convey their hives also in boats from shore to shore, in order to reach newer and more abundant pasturages than what they leave. In one of these voyages we are told, that a hive being accidentally overturned, the enraged bees so keenly attacked the seamen, that they were glad to leap overboard and swim to the shore, which fortunately was not distant. The extent of this practice justifies our recommending it as one effectual method of increasing the quantities of honey. The hives must be transported on a spring cart, which, if well hung, an essential quality, ought to travel expeditiously through the night; and they should also be kept cool. Small holes, for the admission of fresh air, should be made in the bottom and sides of the hive; but the operator need not dread the consequence of keeping his bees one or two days in total confinement. In changing the situation of the apiary, certain conveniences must be sacrificed; but when it remains stationary, its proper position is in a field or garden, where it is sheltered from the winds, and protected from the access of cattle and the curiosity of mankind, by a railing. Flowers and shrubs ought to be in the immediate vicinity, and trees at a distance. It should not be encompassed by high walls, for the bees, from either being heavily laden, or fatigued with their labors, or affected by the sudden chill of evening, predominant in our own climates, are unable to surmount it: and there are the same reasons against its being encircled by a thicket. A southern exposure is not indispensible, as Bergman properly observes; but hives should seldom stand in the shade. The apiary should be freed of weeds and tufts of grass close to the hive, as they harbor vermin: and spreading sand or gravel around the hives, is beneficial both in obstructing the growth of weeds, and in absorbing moisture. To save the trouble of attendance, it is convenient to have the apiary in the vicinity of a dwelling house.

After the site of the apiary is chosen, it is necessary for the cultivator frequently to inspect his hives, to ascertain whether they are in a flourish-

ing state, or suffer from disease and the inroads of enemies. Bees, in common with other animals, are liable to various diseases. The Abbé della Rocca informs us, that almost the whole hives in the isle of Syra, in the Archipelago, were destroyed by an epidemic disease which prevailed from 1777 to 1780. In this case, some vice or corruption seemed to originate among the young brood, which, infecting the bees, produced their death. A kind of dysentery of diarrhœa attacks bees at certain seasons, which is extremely injurious; the commencement is seen by the foulness of the combs, which must be pared, and the tainted portion taken away. Some cultivators pretend to cure this disease, which, they assert, arises from the nature of the honey collected, by supplying the bees with rosemary and honey diluted with water: others recommend a syrup, prepared with equal quantities of sugar and wine and a little nutmeg, a singular remedy: and a third-class conceive a mixture of two pounds of clarified honey and as much sugar, with a pound of white wine, beneficial. Bees are likewise subject to a disease of the antennæ, which, though not dangerous, renders them dull and languid. It appears by discoloration like moulding, and is said to be curable by the preceding preparation. Toads, frogs, and mice, are reputed great enemies to bees: but we doubt whether it be truly so with regard to the two former, in this country at least; and the ravages of the latter are certainly not general. Perhaps, while the bees cluster together in rigorous winters, they may penetrate the hive and devour the combs; at other times it would be too dangerous an attempt even for animals better protected. Birds of several species, particularly swallows, sparrows, and red-breasts, are also ranked among the enemies of these insects: with respect to which, likewise, we should wish to see the facts better ascertained before giving them credit. Spiders and snails, which are considered noxious, can do little harm; for in this island there are very few, if any, of the former capable of contending with a bee, and the only damage done by the latter is soiling the hive. More dangerous are the larvæ of a small moth, hatching from eggs deposited within the hive, as they are destructive of the comb, and likewise the *sphynx atropos* in its perfect state; but most formidable of all are wasps and hornets, and plunderers of their own species. The first two being strong and vivacious animals, are able to destroy living bees, and suck the honey from the abdomen; or they may penetrate the hive, and consume the comb. When a wasp tries to enter, it is resisted, but having made good its way, we believe it is then little regarded, and may leisurely satiate itself with honey. The nests of wasps ought to be carefully traced out and destroyed; if in the earth, by pouring boiling water down their hole, or kindling a quantity of straw where they are less accessible. Observers confidently affirm, that a whole swarm of bees, from defect of food and other causes, sometimes interrupt their natural collection, and becoming a band of plunderers, rob the stores of their neighbors. In this case, which will appear from the contests perpetually taking place on the boards and about the entrances of other hives, it is necessary to ascertain whence the depredators come, whether from neighboring hives or from those at a distance. If their plundering seems to arise from want of food, as those scanty provisioned are more apt to follow this method of supplying themselves, they must be fed at night when the sun is down, and while all the bees have returned. It is reported not to be an uncommon incident for a swarm to abandon their own hive, and take possesion of another to relieve their necessities. Bees, on losing the queen, having no interest to prosecute their labors, if brood be wanting in their combs, sometimes begin to pillage the hives in the neighborhood. The obvious remedy is here to provide them with a queen, whereby all their faculties being aroused, they will be reclaimed to their usual nature. Schirach warns us, on removing comb from a hive, to beware of scattering or dropping it, and to replace the hive exactly in the same position as before, otherwise the inhabitants of stronger colonies will obtain more ready access to attack the honey in the combs, or to collect what has fallen from them. The weakness of a hive is one great inducement for its neighbors to pillage; and as cleanliness, and being kept free of vermin, preserve the vigor and activity of its inmates, due attention to them should not be neglected. Removing the hive which is the object of plunder, and covering it with branches, has been recommended; and such an expedient will certainly present a good chance of escape.

But all the devices adopted by us are poor and insignificant, when compared with those resorted to by the bees themselves to provide against danger. Here we have an opportunity of admiring that wonderful instinct, which animals, standing so low in the scale of creation, exhibit. Even supposing them to possess nothing analogous to reason; that the regard for their queen, and the watchful care of their young, result from some pleasurable sensation; that the massacre of the drones originates from some sudden principle of aversion; we cannot refer their precautions to avoid danger to any relative source. It is evident that they labor in concert; that their operations tend to one general object; and that they are aware of it being fulfilled. Surely all this cannot be done without some mode of communication with each other: but considering that every thing they perform is in the dark; nay, that the perfection of their work is partly proportioned to the privation of light; the difficulty of conceiving how they can know each other's proceedings is greatly increased. It has been warmly contested, whether bees are capable of imparting what we should call thought in beings higher in the chain of animated existence, and especially, whether there be any thing resembling voice among them? We have already remarked, that the workers can retain young queens in their cells after attaining complete maturity, which they are capable of doing by strengthening the seal or covering with additional wax; and that they regularly liberate the oldest of those of different ages. A sound, which we cannot compare to the buzzing of insects, by the balancers beating on their wings, is heard from the young queens. No researches, however, have yet detected the organ, if it is an external one, from which the sound proceeds. When a queen is hatched, she seeks the cells of those that will become her rivals, and uses every possible exertion to destroy them; but the workers, to which other queens, even in their imperfect state, are precious, generally present the most decided opposi-

tion, and render her attempts abortive. Yet, from the property which the queen possesses of emitting that certain sound before heard from her cell, their resistance becomes vain; it paralyzes all their faculties; and she proceeds to operate destruction. The following observations, by a distinguished naturalist, on this head, lead to an illustration of the peculiarities among bees when exposed to danger, though they more immediately relate to another branch of our subject. "The first of a number of cells containing females, opened on the ninth of June, and a young queen, lively, slender, and of a brown color, escaped from it. Now we understand why bees retain the females captive in their cells so long after the period of transformation elapsed; it is that they may be able to fly the instant of being hatched. The new queen occupied all our attention. When she approached the other cells, the bees on guard, pulled, bit her, and chased her away: they seemed to be greatly irritated against her, and she enjoyed tranquillity only when at a considerable distance from the cells. This proceeding was frequently repeated through the day. She twice emitted the same distinct sound or clacking that had been heard in her prison, consisting of several monotonous notes, in rapid succession: and in doing so she stood with her thorax against a comb, and her wings crossed on her back: they were in motion, but without being unfolded or opened. Whatever might be the cause of her assuming this attitude, the bees were affected by it; all hung down their heads and remained motionless. The hive presented the same scenes next day. Twenty-three royal cells yet remained assiduously guarded by a great many bees: when the queen approached, all the guards became agitated, surrounded her on every side, bit her, and commonly drove her away. Sometimes, when in these circumstances, she emitted the sound, and assumed the posture just described: from that moment the bees became motionless." Several queens were successively liberated, some of which had led out swarms; but eighteen cells still remained to be guarded. "The fifth queen left her cell at ten at night; and two queens were now in the hive: they immediately began fighting, but came to disengage themselves from each other. However, they again fought several times through the night, without any thing decisive. Next day, the thirteenth of June, we witnessed the death of one, which fell by the wounds of her enemy. The duel was quite similar to what occurs in the combats of queens. The victorious young queen now exhibited a very singular spectacle: she approached a royal cell, and took this moment to utter that sound and to assume that posture which strike the bees motionless. For some minutes we conceived, that, taking advantage of the dread shown by the workers on guard, she would open the cell and destroy the young female: and she in fact prepared to mount the cell; but in doing so she ceased to emit the sound, and quitted the attitude which paralyzes the workers: the guardians of the cell instantly resumed courage, and by means of tormenting and biting the queen, drove her away."

These remarks are necessary to illustrate, how one of the principal enemies of bees can attain its ends with impunity. The *sphinx atropos*, which was long unsuspected, has recently been discovered to be a most formidable ravager of their stores. In years, when they had multiplied to an uncommon extent, whole districts of hives were plundered of all their honey: and it was not until after the injury had been done, that it was traced to its real source. Numbers of moths had made their way into the hives, and satiated themselves with honey so long as it remained in the cells: and possibly as it decreased, the season when these animals abounded came to a close. But it must appear very surprising how a moth, quite unprotected with external means of defence, and liable, at the moment of its entrance, to be pierced by a thousand stings, each of which inflicts a mortal wound, can venture on so hazardous a pursuit. We must here recollect, however, that this identical insect is one, perhaps almost the only one, supposed to possess something like voice: and, at the same time, that the sound emitted by it bears a narrow resemblance to the peculiar sound proceeding from the queen bee, which paralyzes the workers. It is thence far from improbable, that the first resistance opposed to the entry of the moth may be productive of this sound, which, though arising from accident alone, may have the singular effect of depriving the bees of the power of repulsion. If these facts be firmly established, and the conclusions just, it would be well worth the attention of cultivators to investigate whether any similar sound can be artificially produced, and whether it will have influence on the bees. They are perfectly aware of the presence of so redoubtable an enemy, and the danger resulting from it. In autumn 1804, the copious collections of honey which had been made during summer, had entirely disappeared, and the moths were uncommonly abundant. The owners of a number of hives resolving to protect them from further pillage, closed their entrances with tin gratings, where the apertures were proportioned to the size of the bees, on the 17th of September; but not having enough for the whole, two were left unsecured. It was seen next morning on examination, that, during the night, the bees themselves had taken the necessary precautions, by contracting the entrances of their hives, so as to make them quite safe against invasion. Each was completely blockaded by a wall, composed of old wax and farina, in which the bees had taken care to leave apertures corresponding to their own size: two, that would prevent above two bees passing at a time, were fashioned like inverted arches; a third was broad enough in front to admit of the passage of several bees at once, but so low, that they were obliged to lean over on one side to get through. All the other hives proved, on inspection, to be constructed in the same way, even where provided with the tin gratings. In other instances, the bees had constructed a double wall at the entrance of the hive, with covered galleries, so narrow, that no more than a single bee could pass: fifty-three swarms began these operations in the course of the same night. Bees, when attacked by plunderers of their own species, have been known to adopt similar precautions. On the 9th of July, 1804, an observer having found some of those, belonging to a neighboring hive, lying dead on the board of a swarm that they had come to pillage, watched the proceedings of the latter. On the 11th of the month, they had built up their entrance, leaving only two apertures at the part highest above the board, which would admit no more

than one bee at a time: they were thus proportioned to the size of their enemies, and could be sufficiently guarded by two workers. But, in the sequel, they were enlarged, and on the 22nd, they would have allowed two or three bees to pass at once. "Was this," the observer asks, "because they were sensible of having drones among them, for which these openings were too small?" No farina being in the country at that period, the bees had built their wall of pure wax taken from the edges of their combs. In a subsequent fortification erected during September, they used farina along with the wax employed in it. It is important to attend to the circumstances which we have now exposed, for they demonstrate the precise plan that should be followed by a cultivator in protecting his hives. As the seasons of danger approach, he ought himself to diminish their entrances, an expedient which will prove the chief means of security. During the period of swarming, they should be left altogether free, but after that time, they must be contracted. When in danger of being pillaged by their neighbors, there may be only two apertures, each so large as to allow two or three bees to pass: and in countries where their great enemy, the *sphynx atropos*, abounds, the apertures, when the chief collection of honey takes place, must be made very low, that this insect may be excluded. Some observers have used a longitudinal or triangular cover of the entrance, turning by one corner on a pivot; by simply elevating or depressing which, the access was impeded or facilitated. An intelligent naturalist recommends adapting a slider, containing various apertures, at the entrance of the hive: merely by shifting it along, those suitable to the different seasons and conditions will be presented for the exit of the bees.

From the preceding remarks, the necessity of frequently inspecting hives is evident; not by tearing them from the boards, as is usually done, to the manifest destruction of the combs and derangement of the whole colony, but by examining the entrance with caution, and by using hives of such a construction that part of them opens to expose what is contained within. An apparatus of the description proposed by Bergman, should be kept for weighing the hives from time to time, that the increase or diminution may be known. This consists of a steelyard hung to a small frame: from one arm of the steelyard the hive is suspended by three slight chains, and a weight shifts along the other. The common iron spring steelyards may be conveniently employed, providing their accuracy has been previously ascertained.

When seasons are peculiarly unfavorable for the secretion of honey, sometimes, we have said, a whole swarm may perish in the middle of summer. Then, or when they are deprived of too great a portion of their honey, it becomes the cultivator's care to supply the deficiency. There are various methods of doing so, always regulating the supply by the number of bees and the temperature of the atmosphere. The hive may be placed above a section of another hive containing several combs with honey; or combs may be laid on the boards of the hive before the entrance, which is less to be recommended from exposing the bees and their provisions to the invasion of strangers. Syrup of sugar, treacle, and other sweet substances, may be given them as food, introducing their allowance every afternoon in nutshells, or in a vessel with a grated covering, by an opening in the back of the hive. Unless the supply be daily administered, it is extremely difficult to preserve the bees; and by admitting of longer intervals, the most skilful cultivators have failed. A practical operator informs us, that he takes an oblong box, in one end of which is a reservoir containing honey, that is allowed to flow from the bottom of the reservoir under a thin float buoyed up by cork. This float has many small perforations, through which the bees standing on it supply themselves with the honey. There is one hole in the side of the box, which is to be applied to the entrance of the hive, for admitting the bees above the float, and another on the opposite side, which is opened at pleasure, to allow them to escape, should the box be too much crowded. The lid of the box is a glass pane. On pouring honey into the reservoir, the float rises, whence there should not be such a quantity as to raise it close to the lid or pane above. The box is about ten inches long, four broad, two and a half deep, and the reservoir is an inch wide. When used, the hole in the side is to be placed close to the entrance of the hive, which must be gently rapped on if the bees do not immediately find the way down. It is entertaining to observe bees accustomed to be fed in this manner, watching the approach of the feeder; when the ordinary time draws near, they rush down to the box the moment that it is put on the board, and after speedily filling themselves they return to the hive, from which they very soon come back for a second supply. By throwing a little fine flour on those leaving the box, it will be seen that they can fill themselves in three minutes, and are absent not above five. One convenience that attends feeding in such a box, is the exclusion of stranger bees; as the sole communication with the interior is from the entrance of the hive. Several practical operators recommend a mixture of sugar and small beer as food, which we should warn others to be cautious of adopting, as they will find honey or syrup quite adequate to their purpose. It is maintained that fruit may likewise be presented to bees for feeding them.

Supposing, by a concurrence of favorable circumstances, that a hive is well provided with bees; that they are protected from enemies, their collections ample, and their brood abundant; the cultivator has to watch it strictly during the summer season when swarming takes place; it is only during the warmer weather that bees swarm, on fine days, and when the heavens are unclouded: if the sun be overcast, they hesitate to depart, awaiting the moment when he shines forth in full lustre. Though what are called precursors cannot be depended on, as we have shown, they are not to be altogether neglected; and in attending to them the time of swarming will scarcely be overlooked. It is commonly between ten and three o'clock, sometimes a little earlier or later, that a swarm leaves the hive, during which interval the owner should be on the watch to follow it. A sudden buzzing is heard, the bees are seen in innumerable multitudes traversing the air in all possible directions, and the entrance of the hive soon appears deserted. After wandering about for some minutes, they are generally seen in small clusters, on some neighboring shrub or tree, which gradually unite round the queen, and all are collected together

in a single heap. If they rise high in the air, it frequently indicates their inclination to take a long flight, which is usually endeavored to be checked by beating pans, ringing bells, and throwing dust or sand among them. The former can have little influence; if it does operate, it may be by producing a slight concussion of the air, which, alarming the bees in the same way as thunder, may induce them to settle; but the discharge of a fowling piece would have much more effect. Bees are conceived to mistake the dust and sand for rain, which they greatly dread; and we often observe them hastening to the hive on the approach of a shower, or when the sky becomes cloudy. Notwithstanding every effort to retain them, they sometimes rise very high, fly to a distance, and are irrecoverably lost. As they are said to fly in a straight line after having taken their direction, they must be pursued, as there is no other method of discovering where they alight. The place of their settling is extremely uncertain. Bonner says they will fly four miles to take possession of a dead hive, and affirms, that he has seen a swarm go into a living one that stood in the same apiary. If they alight in an accessible place, on the branch of a tree for example, after allowing them to settle completely, it must be gently cut off and laid on the ground, and a clean hive supported on two sticks put over it, and the whole covered with a sheet or large table cloth. The bees will soon ascend into the hive, and immediately begin working: late in the evening, when all is quiet within, the hive is to be transported to its station in the apiary. When the cultivator can, by any device, catch the queen and put her into the hive, all the bees will quickly follow. This is more essential to attempt, when the place where the swarm has settled is of difficult access; such as flying to the roof of a house, or the cleft of a tree. Then it is far from easy to dislodge the bees, which is, in the majority of cases, the sole method of recovering them; as we can hardly sanction the following method recommended by Bonner: "The owner should make as much room as possible to get his hand introduced, so as to pull them out by handfuls, and put them into an empty hive." Bees very quickly commence working even in the most exposed and unsheltered situations, unless removed to a hive. The operator should be provided with a dress to protect him from the stings of the bees: the best expedient is to have a close leather jacket and trowsers; the head and face covered, and goggles of gauze to save the eyes. Bees are less disposed to sting during their swarming than at all other times; and there have been instances of their settling on a person's head unattended by inconvenience. We have an authentic account of this from Thorley. "In the year 1717," he observes, "one of my swarms settled among the close twisted branches of a codling tree; and not to be got into a hive without help, my maid servant, being in the garden, offered her assistance to hold the hive while I dislodged the bees. Having never been acquainted with bees, she put a linen cloth over her head and shoulders, to guard and secure her from their swords. A few of the bees fell into the hive, some upon the ground, but the main body upon the cloth which covered her upper garments. I took the hive out of her hands, when she cried out the bees were got under the covering, and crowding up towards her breast and face, which put her into a trembling posture. When I perceived the veil was of no farther service, she gave me leave to remove it: this done, a most affecting spectacle presented itself to the view of all the company, filling me with the deepest distress and concern, as I thought myself the unhappy instrument of drawing her into so imminent hazard of her life. Had she enraged them, all resistance had been vain, and nothing less than her life would have atoned for the offence. I spared not to use all the arguments I could think of, and using the most affectionate intreaties; begging her, with all the earnestness in my power, to stand her ground and keep her present posture; in order to which I gave her encouragement to hope for a full discharge from her disagreeable companions. I began to search among them for the queen, now got in a great body upon her breast, about her neck, and up to her chin. I immediately seized her, taking her from among the crowd, with some of the commons in company with her, and put them together into the hive. Here I watched her for some time, and, as I did not observe that she came out, I conceived an expectation of seeing the whole body quickly abandon their settlement; but instead of that, I soon observed them gathering closer together, without the least signal for departing. Upon this I immediately reflected, that either there must be another sovereign, or that the same was returned. I directly commenced a second search, and in a short time, with a most agreeable surprise, found a second, or the same. She strove by entering farther into the crowd, to escape me, but I reconducted her with a great number of the populace into the hive. And now the melancholy scene began to change, to one infinitely more agreeable and pleasant. The bees missing their queen, began to dislodge and repair to the hive; crowding into it in multitudes, and in the greatest hurry imaginable; and in the space of two or three minutes the maid had not one single bee about her, neither had she so much as one sting, a small number of which would have quickly stopped her breadth."

Supposing that the cultivator desires to augment the number of his hives, without awaiting the period when swarming naturally ensues; or that its operation is checked by the uncertainties of weather, predominant in our climate above all others, he may resort to the expedient of obtaining artificial swarms. Several young queens originate at once in a hive; and the production of two is sometimes so immediate, that although both cannot survive together, they come off in the same swarm. As, by M. Shirach's discovery, bees having lost the queen can procure themselves another, providing there be worker's brood in the combs, we can at pleasure rear successive queens simply by removing the first. If a hive is strong enough, therefore, it may be divided in two; one-half will retain the old queen, and the other will not be long of obtaining a young one. Shirach directs, that the appearance of brood in a hive containing a queen is to be ascertained, which is always about the time that the trees are in blossom, or a little later in Britain. Three or four pieces of comb, with the brood, are to be cut out of the hive, and placed in a rack-work adapted in another hive in the same position as in that from which they came, and three or four hundred bees

must be confined along with it; unless the hive be very large, they should not be numerous; and seven or eight hundred will always prove more than sufficient. Nearly fifteen days being requisite for the production of a queen, as much honey should be supplied every two days as will serve for subsisting the bees. The hive is then to be closed up and transported to a place where the temperature is moderate. Violent agitation ensues among the bees whenever they discover that they are imprisoned, and the tumult becomes still greater on their ascertaining that their sovereign is no longer with them. Silence succeeds, which is next followed by greater noise and confusion than what attends swarming. Immediately afterwards a new operation begins, and from the second day the construction of a royal cell is seen. The confinement of the bees must be protracted some days; but the fourth or fifth, the hive may be carried into a garden, and the prisoners allowed to escape. Their eagerness to do so is such, that hardly one remains in the hive; however, in two hours they return to it again. The entrance must still be closed at night, and the hive carried into a house, unless the fineness of the weather admits of it being left without. If the operator, on opening the hive, finds the brood hatched, and the royal cells well advanced, he should transfer the whole along with the bees into a dwelling of greater capacity, provided a small box has been used with three or four combs of white wax fixed near the top, that the interior may resemble a hive containing work already commenced. Should the queen be hatched, it will facilitate the operation if she can be transferred to the new dwelling: and thus the artificial swarm is formed. It is difficult to perform this operation with the common straw hives; but an expert person may accomplish it by means similar to those adopted in robbing the bees of their provisions. Here the use of the book or leaf hive is especially demonstrated; for it affords facilities in forming artificial swarms infinitely surpassing any others that have yet been devised. Under the conditions above specified, of brood and population, the leaf hive is to be gently separated in the middle, and two empty frames insinuated between the halves. The queen must then be sought for in one of the halves, and a mark put on her, in order to avoid mistake. Should she by chance remain in the divisibn with most brood, she is to be transferred to the other containing less, that the bees may have every chance of obtaining another female. Next, it is necessary to connect the halves together by a cord tied tight around them; and care should be taken to place them on the same board which the hive previously occupied. The old entrance, now become useless, will be shut up; but as each half requires a new one, these ought to be made at the extremities of the two divisions, on purpose to be as far asunder as possible. Both, however, should not be made on the same day. The bees in the half deprived of the queen, ought to be confined twenty-four hours, and no opening made before the lapse of that time, except for the admission of air; otherwise they would soon search for the queen, and infallibly find her in the other division. But provided twenty-four hours be sufficient to make them forget their queen, this will not happen. When all circumstances are favorable, the bees in the division wanting the queen will begin to labor in procuring another; and about fifteen days after the operation, as before observed, their loss will be repaired. "The young female they have reared," according to Huber, "soon issues forth to seek impregnation, and in two days commences the laying of workers' eggs. Nothing more is wanting to the bees of her division, and the success of the artificial swarm is ensured." The time of resorting to this expedient is, when the males are about to originate or actually exist: if attempted earlier, the bees will be discouraged by the sterility of their young female. The structure of the leaf hive enables us easily to ascertain the concurrence of the necessary conditions; for by simply opening the frames successively, their whole contents are exposed to view.

Should the original queen be accidentally lost or destroyed, the cultivator has still another means of preserving the whole colony, which, destitute of workers' brood, would infallibly perish, by substituting a new one in her place. Bees are not immediately sensible of the loss or removal of their queen; their labors are uninterrupted; they watch over the young, and perform their ordinary occupations. But in a few hours agitation arises; all appears a scene of tumult in the hive; a singular humming is heard; the workers desert their young, and rush with delirious impetuosity over the surface of the combs. Then they discover that their queen is no longer among them. There can be no question that this agitation is the consequence of bees having lost their queen; for should she have been intentionally removed, tranquillity returns on restoring her, and, what is very singular, she is recognized. If a stranger queen be introduced after the reigning one is lost or taken away, the agitation continues; the stranger is surrounded, seized, and kept captive by the bees in an impenetrable cluster, where she usually dies either of hunger or from the privation of air. If eighteen hours elapse, the stranger is at first treated in the same manner, but with less rigor; the bees gradually disperse, and she is at last liberated. But should there be an interval of twenty-four hours after the loss of the original queen before the stranger one is substituted, "she will be well received," to use the words of an eminent author, "and reign from the moment of her introduction into the hive." On this head, which it is extremely important for the cultivator to be intimately acquainted with, we are indebted to Huber for some interesting experiments. On the 15th of April, he introduced a fertile queen, eleven months old, into a glass hive, where the bees, having been 24 hours deprived of their queen, had already begun to construct twelve royal cells. Immediately on placing the stranger female on a comb, the bees in the vicinity touched her with their antennæ, and passing their trunks over every part of her body, supplied her with honey. These then gave place to others, by which she was treated exactly in the same manner. All vibrated their wings at once, and ranged themselves in a circle "around their sovereign." Hence resulted a kind of agitation, which gradually communicated to the workers situated on the same side of the comb, and induced them to come and see what was going on. Soon arriving, they broke through the circle formed by the first of their companions, approached the queen, touched her with the antennæ, and gave her honey. After this little ceremony, they retired, and, standing behind

the others, enlarged the circle. There they vibrated their wings, and buzzed as if experiencing some very agreeable sensation. In a quarter of an hour the queen began to move from her original position, when the bees, so far from opposing her, opened the circle at that part towards which she turned, and formed a guard around. While such incidents occurred on the surface of the comb where the queen stood, all was quiet on the other side. Here the workers apparently were ignorant of the queen's arrival in the hive. They labored with great activity at the royal cells, as if still ignorant that they no longer stood in need of them; they watched over the royal larvæ, supplied them with jelly, and the like. But the queen having at length repaired to this side, she was received with the same respect by the bees as she had experienced from their companions on the other side of the comb. They encompassed her, gave her honey, and touched her with their antennæ; and what proved better that they treated her as a mother, was their immediately desisting from work at the royal cells; they removed the worms, and devoured the food collected around them. "From that moment the queen was recognized by all her people, and conducted herself in this new habitation as if it had been her native hive." Thus when bees have had time to forget their own queen, they receive one substituted for her with greater interest, or, perhaps, with more conspicuous demonstrations of it. The cultivator must, therefore, carefully practise one of two things when a queen is wanting in any of his hives; he has either to procure a new one by supplying the bees with brood comb, whereby the loss will be repaired in about fourteen or fifteen days, or he must substitute some supernumerary queen, in which case the impending evils will be completely averted in twenty-four hours.

If two clusters of bees form in swarming, and remain quite separate and distinct from each other, it shows that two queens have left the hive at the same time. But no single swarm being too large, it is necessary, for the welfare of the community, that one of the queens be sought for, and sacrificed, on which the whole bees will unite. There are other situations when it is also beneficial to join two or more swarms together; such as when they are weak on leaving their hives in the summer season, or are sparingly provisioned or peopled towards winter. Numbers, we repeat, independent of affording a better security against external enemies, and in promoting the general activity, are more calculated in society to resist the inclemency of the weather. Those persons, therefore, who cultivate bees solely for the sake of profit, estimate according to the weight of a hive whether it be sufficiently strong. Hives under four pounds, being supposed to contain about 20,000 bees, are rejected; but Bonner affirms, that one consisting of 15,000 will do well, providing the season be not far advanced. The reader will not forget what we have observed of the discrepancies among naturalists concerning the number of bees in a given weight. The last mentioned author, who was a practical operator in uniting swarms, directs, that the mouths of two hives, the lower one full and the higher empty, are to be applied to each other, and a sheet, or large cloth, put round them. "The undermost hive must then be rapped with both hands, in the manner a drum is beat; rapping chiefly on those parts of the hive to which the edges of the comb are fixed, and avoiding the parts opposite to the sides of the combs, lest they should be loosened, and, by falling together, crush the bees between them, as well as the young in the cells. The more bees there are, the sooner will they run into the new hive; for the concussion of the hive by rapping alarms them as an earthquake alarms mankind, and they run to the upper hive in search of a safer habitation. When the bees are thus removed into the new hive, it may be placed where the old one stood, which will collect all the bees together, and within ten minutes the bees will begin working as leisurely as any natural swarm." By this means the under hive will be left quite empty, and another may be substituted, in order that three swarms shall be united. Clusters of bees may also be introduced into a hive to strengthen it, and they are generally received without fighting. While the bees are very active, the places of a strong and a weak swarm may be interchanged; the number of the former which are out being much greater, will return to the latter as their own dwelling, and thus strengthen it. There is likewise an easy and simple method of uniting swarms, which consists in spreading a cloth at night on the ground, close to a hive where two new swarms are to be joined. One of them is to be brought, and put on a stick laid across the cloth, when, giving their hive a smart blow, they will drop down in a cluster. This done, and the empty hive thrown aside, the other should be expeditiously taken from its board, and set over the bees, which will speedily ascend into it, and unite with its inhabitants. By the means here described, a swarm may be increased to any given extent. Bonner assures us, that his mode may be practised in the middle of the day with little danger, and that he has taken off four swarms in one forenoon without a single sting.

It is ungrateful to reflect, that, after all our care in watching the progress of bees, in screening them from injury, added to our admiration of their singular industry, we must at once sacrifice so many thousand lives in order to come at their stores. Yet such is the general, though pernicious practice; and whole colonies, which, in another year, would send forth tens of thousands equally industrious as themselves, are utterly extirpated. The mode of doing so is well known. When the hives cease to increase in weight, or, rather, when they begin to grow lighter, a hole is dug in the ground, and some rags dipped in melted brimstone being inserted in the clefts of twigs stuck into the earth, the matches are kindled, and putting the hive above them, the bees are quickly suffocated, and fall down in a heap. Some authors strenuously defend this practice, contending, that all expedients to save the bees are both difficult and precarious, and that they do not produce the same advantages. We conceive that its facility, combined with inveterate adherence to established customs, has proved a strong recommendation. But the majority of modern cultivators are disposed to preserve the bees, while they share their collections. Towards the end of September, when all the flowers have faded, when there is little brood in the combs, and the bees are beginning to consume the honey they have laid up, they may be frightened out of the hive by beating on it, and the combs then safely taken away. This,

however, would reduce the owner to the necessity of feeding them during winter, whence an earlier season is generally chosen for it, that the bees may still have time to lay in winter provender. The highest part of a hive being always filled first, and with honey of the finest quality, it may be taken in the midst of summer if the bees are kept in boxes, simply by removing the upper one, and substituting another below, if that be required. As every comb is seen in the leaf hive, any one of the whole can be removed at will, and new divisions inserted. The stores of the bees should be moderately partitioned with them, and due regard always paid to the advancement of the season, and the state of the atmosphere. We cannot tell how much they will produce. Thorley declares, that, in some summers, he has taken two boxes from the hive, each containing thirty pounds of honey. We hear of hives weighing seventy, eighty, or even a hundred pounds; but these bear no comparison with what M. Duhamel relates. A clergyman in France, who had placed a well stocked hive over an inverted tub with a hole in the bottom, obtained no less than 420 pounds of honey and six of wax from it. The cultivator should know the exact weight of his hives, and mark their gradual increase or diminution, which will enable him to ascertain the proper time of taking the honey. Bonner judiciously observes, that "the harvest of honey, like that of corn, is earlier or later, more plentiful or scarce, in different years, according to the weather and the climate, and the variety of the seasons and situations." Sometimes he has known a hive become gradually lighter after the first week of August; at other times, in favorable weather, hives situated near heath have continued working actively during the whole of August, and the greater part of September, and daily became heavier.

Of the practical separation of honey and wax we need say little. as it is universally understood by those who cultivate bees for profit. That honey which is most fluid, and runs most easily from the comb, is considered the best and finest. To promote the separation of the rest, the combs should be cut into very small portions, and exposed before a fire, to render the honey more liquid; the product will be honey of the second degree of fineness; and the remainder should be heated still more in a vessel over a fire, and then squeezed through a canvas bag, which will produce a coarser kind, well adapted for feeding bees. It facilitates the operation, to erect a stage of three or four sieves, one always finer than the other from the top, and in a short time the separation is effected. Honey-comb, wrapped in paper, and kept in a cool place, may be preserved entire during a whole winter or longer. To purify the wax, nothing more is necessary than boiling the empty combs, and those deprived of the honey, in water, and removing the scum which will rise in the sucessive meltings. The Abbe della Rocca proposes to put a quantity of comb, tied up in a linen or woollen bag, into a cauldron of water; as the heat increases, the wax liquefies, and, escaping through the interstices of the bag, rises to the surface, while the refuse is retained behind. This is a simple, and, as we conceive, very effectual method.

We apprehend that very few precautions are necessary for preserving bees in winter. They are not torpid in that season, provided they be numerous, and then they cluster together towards the top of the hive. But, like other insects, they are liable to torpidity when single, or where there are few collected together, and that torpidity, by an extraordinary increase of cold, will end in death. With the view of saving their provision, it has been proposed to keep bees torpid, or in an ice-house all the winter. It is undoubted that in a certain degree of cold they cease to consume honey, and animals may live an indefinite time in a state of torpidity. The hives ought not to be exposed to sunshine in the depth of winter; for bees are induced to go out, and the sudden cold that follows deprives them of the power of returning.

The cultivation of bees forms one considerable branch of rural economy, and we could wish to see it much farther extended. This country is capable of supporting at last four or five times the number of hives now kept in it; and, without indulging in the speculations of extravagant profit, which are generally entertained by the authors who write on the subject, we will confidently affirm, that every one who attempts keeping bees on a moderate scale, and pays them some attention, will find it advantageous. There are repeated instances of bees swarming naturally three times during the season; and in the present year, 1810, we have known five swarms come from a single hive. Bonner calculates, that 20 stock hives in each parish of Scotland, or 16,000 in all, would in seven years, by each merely producing one swarm, augment to above two millions and forty-eight thousand. He allows a deduction of forty-eight thousand for losses, which leaves two millions of stock hives. The loss, however, would be much more considerable; but from the parishes being about a fifth above what he supposes, the difference will not be proportionally great. Such an increase could hardly follow, and some unfavorable years might be destructive of most of the stock; yet, on the whole, the hives would be numerous compared with what they were in the outset. By another calculation, he supposes an individual purchasing five hives at 1*l.* each, will obtain, in ten years, 2560 swarms, which, valued at 10*s.* each, makes a profit of 1280*l.* He supposes that each hive gives one swarm annually; if they give more, that the latter are to be allowed for expenses and incidental losses. But in similar calculations we should hardly look further than three years; and it is quite moderate enough to say, that each hive will give one swarm, which may be preserved until the end of the third year. Therefore, as the price of hives in this year, 1810, is 2*l.* 2*s.*, supposing a stock of ten is obtained, it is far from improbable, that, at the end of the third year, it will be found to have increased to eighty; and it is likely, also, that other thirty or forty swarms have left the stock hives, or that first swarms have sent out a colony. The reasons we have already given show why an excessive number of bees cannot be maintained in one place; and speculations in rearing them should be divided among several individuals residing in different districts. The trade of foreign countries in wax is very considerable; and the increasing demand for it may render the culture of bees more worthy of notice at home. In the year 1806, there was exported from the port of Mogadore, in Africa, 234,555 pounds of bees wax.

The honey bee is frequent in the wild state in

warmer climates, but is very rarely to be found in Britain; nevertheless it is said to exist; and that a hive was discovered within these some years. Thus the animal may have either been domesticated at a very remote period by the inhabitants, or it may have been brought from abroad. Naturalists doubt whether the wild honey bee is a native of America, though existing in numbers in the woods. It is rather supposed to have been carried thither in the sixteenth or seventeenth century. Honey is said to be a great article of subsistence in Madagascar, and in other places where bees are common in the clefts of trees. In Africa, there is a small bird called *cuculus indicator*, or the honey bird, which uttering a peculiar note, and flitting from bough to bough, will infallibly lead the traveller to a swarm in some hollow of a tree.

FRUIT TREES.

From the Newburyport Herald.

The famous Pickman farm, in Salem, the best in the country, is lined round the borders of the field, with engrafted apple trees. These trees are very thrifty, deriving most of their nourishment from the ground under the stone fences, which keep the soil loose, warm and moist, and preserve the roots of the trees from external injury. The trees in this situation are an ornament to the farm, while they are no hindrance to the farmer in cultivating his field, nor injury to the crops by withdrawing nourishment, like those in the interior of the field. Yet those trees round the field, are believed to yield a greater profit than the annual crop within, with all the labor necessarily bestowed upon it; and the annual sales of the apples and fruit on this farm are said to be enough to purchase a farm of moderate dimensions in the interior of this state.

WOOL.

From the Genesee Farmer.

Few are aware of the importance of this article, as an item in our productions, or the amount which it already reaches in the sum total of value. Two years since the number of sheep was estimated at twelve millions; it is now not less than fifteen millions. Allowing the estimate of three pounds per head, the clip of the present year would be forty-five million pounds of wool. We have been careful observers of the price of wool, and find it has ranged from 40 to 60 cents per pound, some few lots going above, as some have fallen below, the prices named. To be sure of being within the amount, we will take the average at 45 cents, and at that rate, the last clip of wool would be worth more than twenty millions of dollars. Yet this is but one item in the productive industry of the north.

At the present prices of sheep and wool, the business of growing them is a profitable one; and we think may with safety be calculated upon as a good one for time to come. Wool of good quality could hardly fail to pay as an article of export to England or France, should present prices abroad be maintained, and the supply for home consumption in this country be exceeded. To prove that growing wool is a good investment of money, we have only to look at the cost, expenses and returns of a flock. A flock of good ewes, with proper management, will hardly fail of doubling their numbers within the year; and if to the sales of the wool the value of the lambs is added, it will be seen, after deducting the expenses of keeping, that a handsome profit remains. But to have good sheep or wool, more attention must be paid to them than is usually given. Sheep that get their living by hook or by crook; that are allowed to gather in their fleeces all the burdock and other burweeds that line too many of our roads and fences, and fill our woodlands; that are exposed to all the vicissitudes of our severe and variable climate without shelter; or barely make a [shift to] live through the winter, cannot be expected to raise many lambs, or produce good wool. Wool and silk are to be the great resources of our supply of clothing hereafter, and their importance to the country will be proportioned to their general use.

SWEET POTATO PLANTS STARTED IN HOT-BEDS—A NEW METHOD.

From the Southern Cultivator.

Monrovia, Ark. July 17, 1839.

Mr. D. Clayton.

Dear Sir.—Your invitation to the readers of the 'Cultivator' to offer to the public through its columns, the result of any experiment, or information acquired in any other way, that would enlighten the public mind on the all-important subject of agriculture, seems to be general, and not directed alone to the learned and literati, but alike to the *clodhopper* and scentific agriculturist; which encourages me to submit to the public a new method of bedding out sweet potatoes; though with the utmost diffidence I assure you.

By using a hot bed, made on the following plan, which was suggested to me by one of my neighbors. I drew slips from my yams and Spanishes, on the 10th of April, and by the last of June, the yams had attained the ordinary size of "eating roots;" and I have this moment measured three, that are from 6½ to 7 and 7¾ in. in circumference. It was perhaps owing, in a certain degree, to the season being unusually forward.

For one bushel of seed, I made a bed 8 feet long, and 4 wide, (wider than this would be inconvenient,) by driving posts into the ground, and weather-boarding up 2 feet on the east side and each end, and on the west side 5 feet, so as to give the advantage of the morning sun, and shield it as much as possible from the scorching influence of the evening sun. I filled up my box with straw 2 feet deep, made as solid as possible by mauling, and then covered it 4 or 5 inches thick with good stable manure. I then wet it thoroughly to the ground, and spread a coat of light soil, clear of clods, 1½ inches thick. My potatoes were then placed in so as not to touch each other, and covered 3 or 4 inches deep with the same kind of soil. The first coat of slips was ready to come off in four weeks from the day they were bedded, and I am of opinion they would have been ready sooner, if the bed had been moistened oftener, so as to have prevented a crust forming on the top, which the tender plant could not break. Artificial waterings are indispensable, in the absence of rain, at least once a day.

M. F. Sadler.

CEDAR QUARRIES.

From the Oswego Palladium.

"On asking a friend from Oswego the other day, who used this term, what it meant, he informed us that much of the cedar which comes from Lake Ontario, is absolutely dug out of the soil. On some of the islands in that lake, which furnish great quantities of that valuable timber, there has not been growing a single tree for many years. Generation has succeeded generation of this timber, and fallen, and been successively covered with earth, and is now dug out for rail-roads, fence posts, &c., in a perfectly sound state."

The above is from the 'Cultivator'. Persons who have been on the island have stated to us similar facts. We believe, however, the quarries are getting exhausted of their most valuable mineral, the *red* cedar, or that it is so deeply imbedded, that that the labor of excavation is not sufficiently rewarded. During this season, all the cedar importations have been of the *white* species. We have heard it stated that on some of those islands, the Ducks and Pigeons for instance, at the north-eastern termination of the lake, there are subterranean passages prevading their whole area. That the roof or exterior surface seems to be composed of agglomerated earth, matted and held together by the roots of trees which rest upon it and have covered it with a thick growth of timber. The vaulted passages or dens below, are filled with cedar logs lying in every variety of position, and which no doubt, formerly, like the rafters of a house, gave support to the superincumbent mass. From the accounts we have had, there are more wonderful labyrinths constructed by nature on Lake Ontario, than that of old upon the banks of Lake Mœris.

MODE OF PRODUCING FINE SOUND PEACHES, FROM TREES PREVIOUSLY UNPRODUCTIVE.

From the Southern Agriculturist.

I opened the roots near the trunk, in the latter part of the winter, to retard the vegetation and expose the worms. I searched the roots where joined to the trunk, and where gum oozed from them, I scraped it away, killing the worms and destroying their eggs. I then directed chamber-lie to be thrown daily round the roots of the trees near the trunks until the 1st of May. When the trees budded, I had the hole round the roots filled with marsh-mud, and some of them with marsh-mud and clay, in equal proportions, extending up to the hard bark of the tree. Over this I threw the poorest sandy earth that I could find, all round under the branches of the trees, and excluded all stable manure from the trunks. If any grass grew up through the sand, I had it hoed from under the trees. When the trees are not vigorous in their growth, I dig a trench round them from three to six feet off from the trunk, according to the size of the tree, and throw manure into that trench, and cover it with barren sand. This is the third summer of my owning these peach trees; two of them were out in the field among vegetables, none were in the yard among the poultry. In the first summer, none of the fruit was matured or worth eating. In the second year they were very fine, sound, healthy, and profitable. This year, equally fine, perhaps better flavored, more productive, and more profitable.

PAUL REMLEY.

Charleston, July 12, 1839.

ON THE CULTIVATION OF THE CAULIFLOWER, AS PRACTISED ON THE FARM OF C. J. WOLBERT, ESQ., AT FRANKFORD, NEAR PHILADELPHIA.

From the Magazine of Horticulture.

Having met with unprecedented success in bringing the cauliflower to the highest state of perfection, by the same simple process of cultivation as the cabbage, and with the hope of stimulating others to "go and do likewise," I am induced to lay before you an extract from my garden diary:—

"Purchased the seed of Messrs. Landreth & Co.; sowed it broad-cast Sept. 19th, 1838, in a bed of common garden mould.

"October the 26th, removed the plants into a cold frame of the same kind of mould.

"April 10th, 1839, transplanted them into the open garden.

"May 29th, cut for the use of the family."

These noble plants stood in the open garden, undaunted, and, with their neighbors, the cabbage, patiently endured "the pitiless pelting of the storm."

My success is fully demonstrated by the following statement of the circumference of six *heads* of the flowers, wholly divested of their leaves.

	Circumferonce.	Weight.
No. 1 - - -	3 feet 1 inch -	8 lbs.
No. 2 - - -	2 feet $7\frac{3}{4}$ inch -	
No. 3 - - -	2 feet $6\frac{3}{4}$ inch -	
No. 4 - - -	2 feet 6 inch -	
No. 5 - - -	2 feet $5\frac{3}{4}$ inch -	
No. 6 - - -	2 feet $5\frac{1}{2}$ inch -	

The circumference of the largest flower, as it, stood in the garden, and taken at the *extermity of the leaves*, was 13 feet $7\frac{1}{2}$ inches.

I continued to cut abundance of fine flowers from May 29 to the middle of July.

With this I send you some remarks by the Editor of the *United States Gazette*, who examined some of the plants on the 15th of last month. [This appeared in our last number, p. 308.]

My object in this instance, is publicity, especially as flowers of this immense size *can only be obtained from full plants*. I am a subscriber of yours, and I shall feel a pleasure in communicating and corresponding with you upon the subject of horticulture.

I am, gentlemen, respectfully yours,

GREGORY LEE.

Frankford, Near Philadelphia, July 31*st*, 1839.

[Mr. Lee will receive our thanks for the above communication, and it will give as great pleasure to hear from him often through our pages. Practical articles are of real value, and, unless professional men came forward readily, and give their methods of cultivation, horticulture will make but slight advancement. We trust that other cultivators will not only adopt Mr. Lee's plan of growing

this excellent vegetable, but will imitate his example, by giving to the public the success which may attend their method of cultivating every plant, fruit or vegetable, which will render them easier attainable by all.—*Ed. M. H.*]

ON CHANGING THE COLOR OF THE FLOWERS OF THE HYDRANGEA.

From the Magazine of Horticulture.

What is there more beautiful and cool to look upon, of the flower kind, than the hydrangea? Placed in the shady piazza, or window, it seems to luxuriate with you in the cooling breeze of the hot summer's day; participating the communing with you in the luxury of light, shade and air. Why! it will cool you, after a warm walk, to look upon its large bright trusses of flowers contrasting with the broad deep green foliage. Then let me suggest to those of your readers who may delight in this beautiful plant, how they may make it sport its colors, showing some very beautiful blending of shades.

For several years past, I have been studying to effect this. Some of my friends suggested the watering of the plants with soap-suds from the time the buds begin to expand; others, a mixture of peat ashes, or the ashes of pitch pine, with the soil; soap-suds produce a luxuriant growth and large flowers; and the ashes only cause some very slight change in the coloring of the petals: others, again, have advised some peculiar compost, in which the plants should be grown.

My own experience convinces me that the best compost for the growth of the plant, is, one half rich garden loam, one fourth old hot-bed manure, and one fourth coarse sand, the whole to be well mixed together. The plants sould stand in a situation where they will only receive the morning or evening sun for an hour or two. When the buds begin to expand, or after they have opened. the plants should be watered with water in which have been dissolved saltpetre and oxide of iron, in the following proportions:—to a table spoonful of saltpetre and a half a one of oxide of iron add one pail of water; these should be well stirred together, and the whole allowed to stand exposed to the atmosphere a day or more, or until it has acquired a temperature of 70°.

I am fully satisfied with the very beautiful variety of coloring which this fine plant produces under this mode of treatment, and I am pleased to communicate this to your readers, hoping that they may meet with the like success; and if they will inform us, in return, of any thing which will effect any other changes in the tints of the blossoms, they will oblige all who love the Hydrángea hortênsis.

Yours,

JOHN D. W. WILLIAMS.

Elm Hill, Roxbury, July 26, 1839.

GREEN CROPS FOR MANURE.

If our absence had not prevented, the queries from H. on the above subject, which were printed in the last number, would have been answered by some remarks immediately following. But the answer would have been merely offered in courtesy, and not for any value of our own practical experience on this subject. The following selected article may serve in some measure to inform H.; though we incline to believe that the writer has, in comparing the values of green crops and dry leaves, as manure, much undervalued the latter material.

In selecting plants to raise and turn in for manure, there are strong reasons for preferring leguminous plants, or the pea tribe, to any grain, (as oats;) and, also, broad-leaved to narrow-leaved plants. All plants draw a large part of their nutriment from the atmosphere, of which foreign supply to their bulk, a greater or less portion is given to the soil on which they grow, by their death and decay, whether the plants be green or dry, or killed and applied by natural or by artificial means. There is no doubt as to this general position; but scarcely any thing is yet known precisely as to the comparative enriching values of different plants, and in different conditions.

Though knowing nothing from properly conducted experiments, or practice, in regard to turning in green cultivated annual crops, we would be directed by reasoning to choose for this purpose, in preference to oats, rye sown on corn ground in September, as early as the corn could be safely removed; next the rye turned under when in blossom, and field peas then sown broad-cast, which would also be turned in, in full growth, and wheat sown. This, besides other advantages, would doubtless serve well for another object of H. which is to cure land over-dosed with marl. Vegetable matter supplied in any form, is the cure for this injury, and of course that object will be best and most cheaply effected by such mode as will most cheaply and effectually enrich the land. [See 'Essay on Cal. Manures,' 2nd Ed., p. 52.]

Our general views on this subject will be given more fully hereafter. In the mean time, we unite in the request to all other persons for information as to results of the practice of green manuring. —ED. F. R.

ON IMPROVING WORN-OUT LANDS.

From the Southern Agriculturist.

Dear Sir,—In your last favor you say, "that about three years ago I published an article in your journal, wherein I recommended the owners of poor lands to improve them, by planting a crop of small grain; then peas, broadcast; and these to be ploughed under before hard frost, for the next year's culture." This, I said, was the practice in Georgia. At your request I am now prepared to testify to the excellence of the suggestion, by my own, and the experience of others. To any kind of soil, green matter, turned under, is ever an advantage, because it returns to the earth what it

takes; and much that it has absorbed from water and the atmosphere. However, a few general remarks are necessary before I give you "my say."

It seems that near every exhausted soil in this state, there is some material in approximation to revive it—that is, clay or marl, high sandy lands, and vegetable matter in a state of nature, or to be produced by culture, nigh all of them. And to one or more of these materials, must we look for the renovation of the soil. By mechanical or chemical combinations, it may be made susceptible of improvement; but after all, vegetable matter in decomposition, or any substance that, when decomposing, will give out the elementary principles of vegetables, such as carbon, hydrogen, and oxygen, constitute the food of plants. Moreover, it will be found in the culture of corn and cotton, or in any other crop planted in as large quantities to the hand, as we do, the soil must be invested by some material in approximity, or the yield will not pay for the cost of manuring. Manures that act as chemical agents, that is, that induce the decomposition of the vegetable matter, may be fetched from a distance; but it will be found that, for any other purposes, their expensiveness will not pay the planter in the yield of short cotton. If these premises be correct, of which my attention to manures has assured me, the first questions for the owner of poor lands to ask of himself are:—1st. What is the nature of my soil?—is it chiefly clay, or marl, or sand; or combined of those three original earths? 2dly. What vegetable matter have I nigh me, or if none, or not in sufficient quantities, how shall I procure it?

To the first inquiry, after he is answered, he will then say—*that soil which absorbs most moisture from the atmosphere, and readily gives it out, is the best for cultivation;* and that a due admixture of clay, sand, and marl, presents the soil desired; and if there is no marl at hand, clay, mixed with sand, and gravel or sand mixed with clay, he may use as next in value. Now, to make these combinations of soils, either of two plants may be selected. The first and most effectual would be, to cart into the field, that one, or more of "the original earths" required, and plough them in: the second would be to mix them in the cow-pen and stable with the manure, to be carted out. Having in this way *created a soil susceptible of being improved by manure*, the planter should then look to the second question; which, because of its importance, I shall dwell on somewhat at large.

To the second question. If the planter has an abundance of dry leaves at hand, he may use them; if not, he may plant rye or wheat; which, being winter growths, can be turned under for the spring crop. And as I am satisfied that the planters of short cotton in the middle and upper country will sooner or later have to use dry or green vegetable matter as a manure, to the relative value of each, let me call your attention. I must also request you to bear in mind, that I intend my remarks to be applied chiefly to the middle country, the dry vegetable matter of whose high lands is less decomposable than that of the sea-board; and, therefore, must be used with more preparation for *instant crops.*

I have used dry leaves both for corn and cotton beneficially on sandy lands: how much more so then would they be on cold, stiff, moist soils, you may easily conceive. I have noticed that those leaves which produced the most *potash* or the most *gum*, are best. Not because of the greater proportion of ligneous matter in them, but, because such leaves are more readily decomposable than others, and their nutritious particles more soluble in water, in which form, the roots of plants consume them. The gum leaf, *for a present crop*, is the first, then the hickory, then the oak; and, lastly, pine trash. The leaves of the yellow pine cannot be used for a present crop, for they are *resinous*, and for nearly a year *insoluble* in *water*, or, in other words, indecomposable. Dry leaves yield one-seventh of themselves in manure, warm the earth in their act of decomposition, and, by opening fissures in it, admit air to the roots of plants. Yet, they are by no means so valuable as the turning under of green vegetable matter; because, *they cost more and do not afford the same nourishment.*

I selected the best hand on my place, the driver himself, and ordered him to see how many loads of gum or oak leaves he could rake and cart in one day; and though the leaves were close at hand, the result was but five loads. He might have carted more, but the difficulty was in the filling of the cart. We have no utensil, and, indeed, it would be difficult to invent one, with which to load; so in "my parts," we have to use a basket, trample the leaves in it, and then in the cart. With pine trash, we might use the ordinary fork, but the oak leaves fall through its prongs. I allow then that the driver, horse and cart, are worth fifty cents a day; I would not hire the same under one dollar. Now I am satisfied by experiment, that not less than one hundred cart loads of leaves to the acre will benefit cotton land, so as to make an *impression* on it; and to cart these, it would take twenty days, and therefore cost ten dollars.

Now, let us plant rye in September, to be turned under in June or July, *while in flower*, with a broadcast of peas; and these to be ploughed in before hard frost, for the spring culture.

One single-plough, planting an acre or more per day, is - -	$ 37½
Half bushel of rye to the acre, or less	50
One single-plough, to plant peas broadcast, - - - - -	37½
One bushel peas, or less, - -	1 00
One double-plough, to turn under pea stubble, - - - - -	62½
	$2 87½

$2.87 deducted from $10 leaves a balance of $7 12½ in favor of green vegetable matter. And this is not all, it has been discovered by chemical analysis, *that while green vegetable matter contains one-fourth af manure, dry vegetables contain but one-seventh.*

But let me take another view. Suppose that by some invention or improvement in the construction of the cart and fork, a hand might increase the number of loads carried in a day, could one have the smallest hope that he would accomplish twenty?—or if he did, that is, reduce the price of carting leaves to $2 87½ the acre, would it be as valuable as green vegetable matter, which turns out nearly double the quantity of manure? But it may be said, that one hundred cart loads of leaves, though containing *relatively* less, will turn out on account of bulk, or quantity, or weight, more manure than a crop of rye to the acre. To this I reply, that to

produce the same effect on the acre as rye, the leaves must be double its *weight;* and, that they are not, you may decide, should you have ever seen the rye in flower, compared with one hundred cart loads of leaves strewed over an acre. The one may contain more bulk, but the former is heavier, and will afford more manure to the soil, independent of the pea stubble, the nutritious qualities of which have been too long known to be denied.

However, I need not inform you how much green vegetable matter is valued as a manure; the books are full of its praise, and none presents a greater number of proofs of its effects than Chaptal's. Whoever uses this manure should not forget *that green vegetable matter should be turned under while in flower, or before it goes to seed.*

Chaptal says, page 94—"In order fully to understand this doctrine, which appears to me of great importance to agriculture, it is necessary to consider the successive changes which take place in annual plants during their growth; first, they produce green leaves, which by coming in contact with the air, receive from it the principles of which I have spoken; subsequently the stalks increase in size and number, and are covered with numerous leaves, which absorb from the atmosphere a degree of nourishment suited to the increasing wants of the plants; the strength, fullness, and depth of hue of the leaves and the stalks, particularly of the latter, increase in proportion to the richness of the soil.

"This state continues till after the period of *flowering*, when a change, worthy of note, takes place; the roots dry up, the stalks wither, and change their colors; and when fructification is at length completed, both roots and stalks have become mere skeletons, which answer but little purpose either for nourishing animals, or manuring earth, During this period of vegetation, what becomes of the juices that were so abundant in the roots and stalks? *They have been consumed by the formation of the seeds.*"

To illustrate this, he gives the experiment of M. Matthieu de Dombasle. This gentleman on the 26th June, 1820, at their time of *flowering*, within a small space, selected forty wheat plants of equal size and strength, each having three stalks bearing heads; he pulled twenty of them, with all their roots, and left the rest to complete their fructification. Having carefully freed from earth the roots of those he had taken up, he cut the stalks two inches above the base, and dried separately the roots, and the stalks surmounted by their heads."

The roots and the portion of the stalks remaining with them, weighed, *grains*, - - - - -	657
The stalks, heads, and leaves, "	1946.5
Total,	2603.5

On the 28th August, the time of harvest, he plucked up the twenty plants which had been left for seed, separating the roots, and cutting the stalks as of the first; of these, the weight was as follows:

	grains
Roots,	419.53
Straw, husks and beards,	1318.75
Grain,	1025.69
Total,	2763.97

"During these two months, the roots and the portions of stalks adhering to them, had lost 236.52

The stalks, heads and leaves had lost - - - - 624.67

Total loss, 862.19

"But as the seed weighed 1025.69 grains, the whole had increased in weight 160.47 grains, troy. From this experiment we may conclude, that the juices contained in plants, at the time of flowering, contributes to the formation of the grain in the proportion of $\frac{862}{1025}\frac{19}{97}$ and that the excess of the weight of the grain which is $\frac{160}{1025}\frac{47}{97}$, arises from the nourishment which the plant absorbs from the air or soil, during the two months of fructification."

From this experiment, we at once see the importance of turning under green crops while in flower, or before they go to seed. The effects of this process are then, 1st. Green matter returns to the soil nearly double that of stubble. 2d. By ploughing it under in flower, we have less grass to contend with the next spring. 3d. By exposing their roots to the sun or the coming frosts, many parasitic vegetables are destroyed, and decomposing, add something to the productiveness of the soil. 4th. By the destruction of roots and parasitic vegetables, less manure is taken from the soil during the winter. 5th. This matter decomposes, and is absorbed by the earth for *early* crops. 6th. The earth has not only received its first required ploughing, but is beneficially exposed to the winter frosts.

Your's, truly, C. R. C.

THE TEA-TREE.

From the Magazine of Horticulture.

Whilst waiting for the return of M. Guillemin, whom the government [of France] has sent to Brazil to procure seeds and plants of the tea-tree, we have only to express our wishes for his success. News was received in January from this gentleman. He states, that he observed in the garden at Rio Janeiro 12,000 plants in full bearing, and he was on the point of setting out for the province of St. Paul, where the number is still more considerable. He mentions that it succeeds exceedingly well in that country, and that half the tea consumed there proceeds from Brazil itself. He paid particular attention to the mode of preparing the leaves, and can now prepare them himself. Every thing leads us to suppose that the exertions of this gentleman will be crowned with success.

ON THE CULTIVATION OF MIGNONETTE FOR WINTER AND SPRING BLOOMING.

From the Magazine of Horticulture.

Probably no plant is more universally esteemed, and generally cultivated, than the mignonette. With the French and English gardeners it has been a favorite for a long time: in this country, however, it has not, until within a few years, been an object of common growth, nor is it at the present period so well known as it should be, except in the immediate vicinity of our large cities.

The mignonette is a native of Egypt, and was introduced into Britain about the year 1754; but it has become so generally diffused, both there and in France, that it has become in a degree naturalized. It is not long since, that we read, in some foreign periodical, an account of its growing upon the walls of an old ruined chatean, in the neighborhood of Paris, springing out from every crevice where the seed could obtain a lodging place, and literally covering the walls with its odorous blossoms. In the Paris *Marchè aux Fleurs* thousands of pots of it are annually sold, and the window of the peasant, as well as the saloon of the opulent, is decorated through the season with pots of this favorite plant.

The mignonette is of remarkably simple growth in the open ground, and when once the seeds are planted, it will retain possession of the soil, springing up from self-sown seeds, and flowering early and abundantly every season. Successive sowings in May and July will afford a constant supply of neat and compact plants, filled with flowers. In rich moist soil, the plants grow luxuriantly and spread out widely, but have a very scanty display of flowers: it is in a dry and rather hard soil that they show themselves to the best advantage; for in such a situation they bloom early, and, without spreading out their recumbent branches too far, are, at the same time, overloaded with blossoms. Those cultivators, therefore, who would have the plants in the greatest perfection, should select the driest spot in the garden, and sow the seeds thickly. But it is for the production of good plants for flowering in the winter, that we commenced these remarks.

To bloom the mignonette in good perfection from the decay of the out-door plants in the autumn, until the return of the flowers in the spring, it is necessary that there should be two successive sowings, viz. one in August, for blooming about Christmas, and another in September, for blooming from February till May.

Select for the purpose as many No. 2 pots as there are plants wanted; fill them with a compost mixed in about the following proportions, viz. one half good light loam, one quarter leaf mould, and one quarter coarse sand. First give the pots a good drainage, for the health of the plants depends much on this; then fill them up to within half an inch of the rim, giving the pot a slight rap to settle the surface, sow the seed thickly, and cover it with about an eighth of an inch of the same compost. A frame (an old cucumber bed will answer,) should then be ready to receive the pots; set them so that they will not be far from the glass, and give a gentle watering; put on the sashes, and shade with a mat in the middle of the day, if the sun is two powerful, until the plants are well up. Give water cautiously and in small quantities, as the plants will damp off if they are kept too wet. Thin out the plants, leaving only three or four in a pot.

In the month of November or December, according to the mildness of the reason, the plants should be removed to the green-house or parlor: in the former place they should be placed on a shelf within two feet of the glass, and if nearer they will thrive better. Water should be given sparingly, and when the plants get up an inch or two, the tops of each should be pinched out in order to make them branch well. They will now grow slowly, and early in January will come into bloom. In the parlor they should be set as near the window sash as possible, and in the most airy part of the room.

When the plants have done blooming in the spring, they may be turned out into the border, where they will throw out new branches, and make good plants for bloom all the summer. We tried this method last spring, and at this moment the plants are now before us, flowering as profusely as seedlings of this year. When they are turned out, they should be cut down nearly to the soil.

The only requisites to be observed, in pot culture, are a good drainage, light soil, and careful watering.

BEES.

From the Genesee Farmer.

Mr. Tucker—In the Monthly Genesee Farmer for August, I find an article on the subject of bees, from Doctor Henry Spencer, of Starkey, whose physiological and scientific attainments, justly entitle any remarks on the above subject, from his pen, to favor and regard; still, he has to some extent, as I conceive, fallen into the same error which he endeavors to correct in others. His remark that we should not attempt to give advice to others, where only one or two isolated cases have afforded us opportunities for observation, is very just.

He condemns the large hive recommended by L. N. of Windsor, Ohio, on the ground, as he alleges, of having made *numerous* experiments of the kind himself, all of which proved failures.

If he will examine personally the bee-houses in use among the farmers of Chenango, Broome, and Cortland counties, which are no other than large bee-hives, or houses built of brick, wood, or stone, from six to twelve feet square—in the upper part of which, a swarm of bees is placed on rods, crossing each other in various directions—and witness their progress in the multiplication of numbers, and of consequence a proportionate increase of honey, his prejudice against large hives will probably be diminished. I am well aware, as are those who use the large hives, that the bees do not increase in numbers, nor in the accumulation of honey, as fast after two or three years, as they would if treated in the usual way with a multiplicity of small hives or boxes; but it is a great tax upon the time of the farmer to be compelled to leave his work during the swarming season, (which to him is usually a very important one,) and perhaps a hand or two besides, sometimes several times a day, to secure the new swarms as they come out. Whereas, in the large hives or bee-houses, the bees continue to labor for years, as the writer of this has had the pleasure of witnessing, without any trouble to the owner—who goes at any season of the year and selects such quality of honey as he chooses; and when done in the season of flowers, which is the time usually selected, the bees immediately set to work, with renewed industry to supply the loss. And it is found that by frequently removing portions of the honey, the bees work as industriously as they do in smaller hives. The bees are not permitted to go out and in through holes or notches cut for that purpose, as is usually the case with small hives; but tubes are inserted into the ends or sides of the building near its top,

through which they easily find egress and ingress. But the bee-moth cannot find its way in; it lights upon the building and examines every crevice, through which it tries to find its way to the honey; but never lights upon the *outer ends* of the tubes, which project some 12 or 15 inches from the building. The same kind of tubes, are used with advantage in the common small hives.

Dr. S. says, also—"A few months since, I saw an article in the Genesee Farmer from the pen of Dr. E. Barnes of Reading, which I fear is calculated to mislead. He says his neighbor buries his bees as he does his potatoes, and was told that they came out in the spring healthy and good condition."

I trust I have no desire to mislead others or do any thing calculated to lessen the profits, great as they are, of that useful insect the bee. One stubborn fact however, is worth a dozen pages of theory alone. The article to which the doctor refers, was communicated, as a method of wintering bees, which to me was entirely new, not however, until I had personally examined the mound, where Mr. Eggleston, the owner of the premises, had buried his bees.

Mr. E. from whom I derived my information, is a man whose character is, I believe, above reproach; and certainly it cannot be supposed he would have continued the practice for several successive years, of burying increased numbers of hives each year, if the doctor's fears are well founded.

Mr. E. says he was faithless at first; and therefore buried the first year only two or three hives; these coming out well in the spring, he was induced, I think he said, to bury thirteen the next fall season; and when I examined his apiary, which was in October, 1837, he had thirty-seven buried. He thinks if buried in a dry soil, they would rarely fail of coming out healthy and in good condition in the spring. I have taken measures to ascertain the further success of Mr. E. in this business, and intend to communicate to you the result.

Geneva, Aug, 22, 1839. E. BARNES.

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Mr. Tucker—Since mailing to you my letter of the 22d inst. in reply to the remarks of Dr. Spencer on the management of bees, I have received the inclosed from Doctor Andrews, which I beg leave to present for publication, in connection with my last, as it so fully confirms the former statement I made on this subject from information derived from Mr. Eggleston. E. BARNES.

Geneva, Aug. 23, 1839.

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WINTERING BEES.

Mr. Tucker—Agreeably to your request, I called on Mr. Eggleston, and obtained from him the following statement of his method of wintering bees, and the success attending it.

In the fall of 1837, he buried 30 or more hives, and the following spring they were taken out without the loss of any. In 1838 he buried 10 hives, with the same success, but lost 7 or 8 hives of bees that stood in his bee house through the winter. He says that he finds very few, or no dead bees under his hives that are buried, and that they winter on much less honey than when left in the house; some small swarms have lost but 3 lbs. in weight in wintering, and the largest but 10 lb. He has buried his bees or some of them, each year, for 4 years past, and has not lost a swarm that was buried, and shall hereafter bury all, that he intends to winter; he has now about 40 swarms. Another fact—those that are buried do much better, and swarm much earlier in the spring.

Mr. Eggleston's method of burying his bees, is to dig a shallow trench in the ground, long enough to set the number of hives he wishes to bury, with a gentle slope in the trench, to carry off the water if there should any collect; and then place the hives in the trench, raised a little from the ground, by a small stone under each corner of each hive, then covers them with straw and lastly with dirt, to use his expression, as you would a pile of potatoes, so deep as not to freeze under the hives.

As to the success of Mr. Eggleston in preserving bees, as described above, there can be no doubt, as it is known to all his neighbors, who (if necessary) will certify to the facts as stated.

Yours respectfully,

ANSON ANDREWS.

Reading, August 20, 1839.

DIFFERENT MODES OF PRESERVING AND PREPARING TOMATOES FOR THE TABLE.

From the American Farmer.

Canonsburg. August 16*th*, 1839.

Mr. J. S. Skinner—As the season of tomatoes is at hand. I will send a few recipes for preserving them for winter use.

Take tomatoes, say half a peck, when ripe, but not too soft, skin them and cut them in two, leaving the seeds or not as you like; lay them on a dish, (I do not mash them;) then take two quarts of strong vinegar, put one table-spoonful of allspice, the same of powdered ginger, the same of cloves, the same of salt, half a table-spoonful good Cayenne pepper; put all (except the tomatoes) in the vinegar; boil it in a very clean brass or bell-metal kettle for about half hour—then strain it through a sieve, put it again on a slow fire, and and when it begins to boil, put in some of the tomatoes, but do not crowd them. When they look clear, take them out carefully with a skimmer, and lay them on a dish; do so until you have them all done, and when cold, put them in a glass or white earthern jar, with the vinegar in which they were boiled. Dip writing paper in brandy or strong vinegar, and put over them: cover them tight, and put in a cool dry place. It is excellent with fresh, or any other kind of meat.

Another—Take tomatoes when ripe, skin them, cut them in two, lay them on large dishes, put them in the sun to dry, turn them often, and when sufficiently dried in the sun, put them in a dry place. They shou'd be exposed to the sun after a damp spell of weather. When stewed or cooked in any way, they are almost as good as when first taken from the vines.

Another and easy mode of keeping tomatoes—Make a strong pickle of salt and water that will bear an egg, make it cold, strain it into a crock, or small keg; take ripe tomatoes, fill the crock or keg, pour the pickle on them, and cover it with a thin stone to keep them under the pickle. In the winter when you want some for use, put them in cold water the night before, and in the morning change the water until they are as fresh you as

want them. Then cook them, or eat them raw with vinegar, pepper and salt.

A cheap and excellent dish—Take cold cooked meat of any kind, chop it fine, season with salt, pepper, and a little butter and spice if you like. Then take stale bread, say one-third to two of meat, soak it in milk or water, taking care not to make it too wet; then take four or six large ripe tomatoes, skin them, chop them fine, put them with the meat and bread, mix them well together, put in a deep dish, and bake it in a slow oven on a stove, for one hour; eat with gravy or not as you like.

Another.—Take cold cooked meat, chop fine, season with pepper, salt, and butter, (if the meat is not fat); boil some potatoes, mash them, put one-third to two of the meat. mix well together, put in a deep dish, bake slow three-quarters of an hour.

In your large cities there is a great deal of provision thrown away by cooks that might be made into wholesome and palatable dishes. All the above dishes I have made. If our housewives would look more into their larders, they might save their husbands some dollars in the course of the year. As this hint comes from an old lady, I hope my fair countrywomen will not take it amiss, but profit thereby; and to make up, I will give another recipe.

To preserve tomotoes in sugar, take them when ripe, but not too soft, skin and cut them in two, taking out the seeds; take, for one pound of tomatoes, three-quarters of a pound of sugar, loaf or brown; loaf is best to keep them. First take two fresh lemons, cut them in thin slices, put them in one quart of water, boil them until soft, strain the seeds out, add the sugar, let it boil for half an hour slowly, then put in as many tomatoes as not to crowd them. Let them boil until clear, then take them out carefully with a skimmer, lay them on a large dish, then put more in, and boil them the same; do so until all are done. When cold, put them in glass jars. If there is not syrup enough to cover them, make a little more. When all is cold, dip white writing paper in brandy, cover them with it, put double paper over them, tie them tight, and keep them in a cool dry place.

I hope that your young housewives will endeavor to be the *mothers* of invention, and have the credit of making their own recipes and cookery.

If you think the above recipes worthy a corner in the Ladies' Department of your useful and valuable periodical, by so placing them you will oblige

E. M. P. DARBY.

For the Farmers' Register.

ON THE MANURING OF ARABLE LANDS BY THEIR OWN VEGETABLE GROWTH.—ROTATIONS OF CROPS.

No. I.

On green manuring, and the advantages of the system in cleansing land of weeds, and destroying insects.

The ploughing in of green crops of annuals, to manure the land on which they grow, has long been recommended by agricultural writers, and has often been practiced to small extent, and under particular circumstances. I am not aware that any experiments have ever been made sufficiently accurate to test the absolute or comparative value of this mode of manuring; and, even without experiment, it has never been made a regular and continuous practice any where. This neglect of the practice seems to offer a strong indication of its want of utility, or economy. But on the other hand, it should be observed that there were strong objections to the system in England, on the score of expense in rent, and in this country, of expense in labor; and in the absence of all certain and unquestionable results of experiment and practice, these certain and heavy expenses were to be expected to out-weigh the prospective and conjectural profits. Clover, only, has been turned in to great extent, in its green state—or common weeds, in the absence of clover; but this was done not so much to gain the manure, as to prepare the land for wheat. And great as has been the profit of this manuring by green clover, the particular share of benefit to the next crop, and to the soil, due to that cause alone, has never been estimated, much less ascertained by proper experiments.

Col. John Taylor was the first who, both by precept and example, established the practice of manuring the fields by their own cover of artificial grass or of natural weeds. This recommendation was most opportune to the then circumstances of the agriculture of Virginia, and that, still more than the reasoning and example of the distinguished author, caused early and extended applications of his "inclosing," or non-grazing system, for improvement. The inducing circumstances were several. Most of the old lands in lower Virginia, were then cultivated in what was called the "three-shift" system—or corn, wheat, and a year of rest, (if rest it could be called,) under close grazing; and nothing was needed but to forbid all grazing of a particular field, or of all the fields of a farm, to establish at once the "inclosing system." Then, the amount of the rubbish natural growth on poor fields was worth so little to the live-stock, that the loss on that score could not be much; and the urgent wants of the poor land for some help, and the hopelessness of ever supplying that want by manure from the barn-yard and stock-pens, served to present the other as the only resource, for general or extensive benefit. Again, there was something very inviting in the idea of manuring the largest fields by merely *letting them alone* for one year, or for two years under the author's extended and approved rotation. Those who before had not manured five acres a year, by means of all other vegetable materials used. might then manure 100 or 200 acres; and if the effects of the manure, should be worth but little, its cost would be still less.

But the vegetable manure thus applied and recommended by Col. Taylor, was not *green*, but *dry*; and he used at least plausible and ingenious arguments to sustain his novel position, that vegetables in their dry state were better for manure than if ploughed under when green. This opinion, and the circumstances of his and the other usual rotations of the country, served to withdraw all his followers from the class of applyers of *green crops* as manure; though Taylor, notwithstanding this limitation imposed by himself, still must stand, from the extent of his practice and influence, at the head of the school of natural manuring by the vegetable growth of the land.

Up to the mark to which the lands are capable of being enriched by vegetable manures alone, (and of the fixing which limit I have fully treated elsewhere,) there can be no means of manuring poor lands so cheap as the non-grazing plan; nor can any be so generally effective and beneficial over a great extent of a previously impoverished country. But besides the limitation imposed, by the nature of the soil, to continued improvement by these means alone, (and by any putrescent manures alone,) there are great inconveniences attending the "inclosing system," and which I can well appreciate, having pursued that system since 1814; rigorously for the first twelve years, and partially afterwards.

The discussion of the comparative enriching values of vegetables when turned in green, or matured and dry, we pass by for the present. The nutritive value of the growth when dry, whether greater or less, would be satisfactory; and the plan of ploughing in during winter, instead of in summer or early autumn, when to prepare for corn, or any other spring crop, is further recommended by several considerations of economy and fitness. But the great objection to that plan, is, that the seeds of all weeds are matured, and planted when ploughed in; that shrubs and bushes are encouraged to grow by protection from cattle, and increased ten-fold in number and size by the long rest of two and a half years; and that the growth and long undisturbed state of the vegetable cover seems to nourish, breed, and protect insects and other vermin, which prey upon the grain crops when the land comes under tillage. And even if clover can be made in some measure to take the place of, and to exclude, natural weeds, the evil of noxious weeds is but partially diminished, and that of insects probably much increased. And the longer the system is continued, and the more the land is thereby filled with vegetable matter, and enriched, the greater do the evils mentioned become; and the more do they increase the farmers' labors and risks, and frequently cause losses of product equal to all the gain from the new fertility produced. In every round of the rotation, it is found that the field thus improved is more foul with its growth, and more troublesome to prepare for cultivation; and that the grain crops are more infested by the weeds of which all the seeds have been so long continually protected and annually sown; and the cultivated crops, in every stage, from depositing their seeds to gathering the product, are the more and more preyed upon by the myriads of insects of various kinds thus nourished and sheltered. Every follower of this rule has found great and still growing disadvantages of these kinds; and the most successful "inclosing" improver can scarcely fail to have foul fields, foul products, and his labors increased, and his increase of product often diminished, by hosts of vegetable and animal plagues. Under such circumstances, neat management and perfect operations are impossible; and the cultivator will necessarily be a slovenly farmer, even if he be an improver of his land, and of his income.

When a soil was naturally well constituted, or has been made so by calcareous manures, so as to produce good clover, then the above-mentioned evils of the system might be mitigated in one or more ways. If the clover should be cleanly mowed, for green-food, or early for hay, then the cheat, spelt, cockle, and numerons other annual weeds, would be cut off before their forming seeds, and their reproduction be in some measure checked. And if then ploughed in for wheat, in August or Septem- (a departure however from Taylor's system,) more weeds might be destroyed, and the food and winter protection of cut-worms and other insects taken away, and their depredations on the next crop thereby prevented, or restrained. But these deviations from Taylor's rotation, even if approved and desired, could be availed of but in small measure, compared to the extent of all the arable land.

The excess of the advantage over the disadvantages of Taylor's "inclosing system" is greater in proportion to the poverty of the land, and the scantiness of its vegetable cover; and the disadvantages increase, and preponderate, in proportion to the subsequent increase of fertility. I therefore not only advocate its adoption, but its being strictly maintained, on all poor and greatly exhausted lands; but would as much recommend its being substituted by other modes of manuring, and other treatment, when the land is already, or after being made, moderately rich. The great recommendation of manuring by "inclosing" on poor lands, is the cheapness of the mode of improvement, which there truly costs nothing to apply, and avail of fully. But on rich land, the loss of the value of the grass would be important, and the nourishing of rubbish vegetable growth, and noxious vermin, would more than counterbalance the increase of fertility.

The evils of this system, as well as its benefits, I know by long experience. But of the substitutes which will be treated of in the following remarks, I have no practical experience, know of not one accurate experiment, and have only reason, and theoretical views, from which to receive impressions.

The main object of leaving vegetables to grow and then to decay on, or to be ploughed into the land, is to *manure* and fertilize. But this should not be all the object. A secondary, and yet very important one should be, to prepare the land the better for subsequent tillage, and also to prevent or destroy the growth of noxious plants and animals. Every particular kind of vegetable serves as food to nourish, and to encourage the increase of some particular kinds of insects; and the longer the growth remains undisturbed, the more the feeding insects are increased. Let their supply be totally cut off, when needed for food, by being ploughed under and killed, and the worms and wingless insects which were there fed, even though they be in countless myriads, must perish, and themselves help to manure the ground, instead of being kept to devour its future fruits. To effect any such object, the ploughing in of the cover must be in warm weather, and not when cold has rendered insect life dormant.

If the vegetable cover be ploughed in so late, or so imperfectly, as not to destroy depredating insects, because of their not then requiring food, or because the food is not enough destroyed, then their numbers are not materially diminished, nor their future depredations checked. And further, if the next planted crop be suitable for their food, as that which first nourished them, then the succeeding crop, in its young and tender state, can scarcely fail to receive great injury. This is strikingly exemplified in the damages sustained by

young corn from the cut-worm, on lands not grazed or mowed, and especially after clover, and the vegetable matter not ploughed under until late in winter. The eggs of the parent stock of insects, which had lived upon the clover, are not in such cases killed by being early exposed to cold, or by being deeply buried in ploughing, and the worms hatch just in time to be fed upon the young corn; and if their change to the chrysalis state did not stop their eating, a crop of corn could not possibly be made to stand under this very common infliction. As it is, the corn is eaten, and replanted, over and over again, until the worms no longer eat, and the later plants are suffered to grow.

Now, if instead of keeping the clover as a seed-bed for cut-worms, it had been ploughed under in August, and thus a change suddenly made from a heavy cover of grass, to a naked surface, offering neither food nor shelter—the greater part of the insects must have perished—and perhaps even field rats and mice might have been thinned, or driven off. In particular, the mother fly of the destructive cut-worm, would have found there no suitable place to deposite her eggs—or if earlier deposited, their new and unnatural position would probably have destroyed them.

This is presented as an illustration of one of the great benefits which may be secured, and which is generally lost to improvers by "inclosing." As to the propriety of following clover by wheat rather than corn, as a general feature of the rotation, that must depend upon other and more important considerations.

For the purpose of destroying noxious plants and insects, the more frequently during a rotation the vegetable cover can be changed, or destroyed by ploughing under, and then renewed in some other kind, the more will that purpose be furthered. With each successive coat, if effectually turned in and covered by the plough, and the seams closed by the harrow, there must perish all the unwinged insects which preyed on that crop; and if any should linger and remain alive so long, they will not be likely to thrive on the next crop, of a totally different kind.

If then the main objects were to clear the land of insects and keep down weeds and vegetable plagues, I think these ends would be best met by ploughing well the corn-fields, as early as the corn can be safely cut up, and shocked or removed, and sowing rye, either immediately, for forward growth, or after some interval, to starve insects; and next spring, when the rye is in flower, to plough it under, close the seams well by immediate harrowing, and sow field-peas broad-cast, of some kind most productive in vines, which again are to be ploughed under in autumn, and wheat then sown. It would seem, that, the ordinary tillage of land in corn, and ploughing for and sowing in rye, the ploughing under that crop, say about the beginning of May, the thick and smothering after-cover of peas, and that cover being also well buried by ploughing and harrowing, would all form so many quick changes and dissimilar conditions of the land, that few enemies, either vegetable or animal, could escape destruction. For the shade and growing of the pea crop (for example) might be as injurious to some of these pests, as a continued operation of the plough. Such indeed there is good reason to believe is the case with the weed called the partridge pea, which is the one most absolutely destructive of the wheat crop; and which seems starved out, and disappears for the time, if field-peas be grown thickly among the corn preceding the wheat. I infer, that if a regular system of green manuring, by crops of annuals, is at all profitable on the score of improvement to the land, or preparation for the succeeding grain crop, that an additional and very important advantage will be gained in the remarkable cleanness of the fields, and the greater security of the crops from weeds and insects. In addition, therefore, to the other supposed and understood advantages of alternating crops, and the superiority of a long and varied rotation to a short and limited one—and still more to the continued recurrence of the same crop—I think that a great, though unsuspected advantage has been in the frequent alterations, and violent changes of condition, proving destructive to vegetable and animal depredators.

Admitting the soundness of these views, still there will be much ground to exercise choice and judgment in selecting plants for green crops, and fixing their order of succession. It would be presumptuous, with the admitted want of experience, for me to prescribe any precise rule or rotation. But I would, in the choice, aim to keep in view the great objects of fertilizing and cleaning the land. For the first object alone, leguminous plants, or all of the pea-tribe (of which red-clover is one,) are better than any others, because, by means of their broad leaves, they draw much more sustenance from the atmosphere than from the soil, and of course give most, by their death, to the soil. For the other object, of cleansing the soil, the more frequent the crops, and the more violent the changes of the kind of crops, and the condition of the soil, so much the better.

Col. Taylor was altogether unacquainted with chemistry and vegetable physiology, and his want of knowledge of these sciences, and of their bearing on agriculture, caused him to fall into, and to utter, some remarkable errors. But by the mere grasp of his strong mind and reasoning power, he arrived correctly at the most important conclusion, the correctness of which can be abundantly proved by the lights which chemistry and vegetable physiology might have furnished to him. He speaks of the atmosphere as the great and inexhaustible reservoir of manure for the earth; and considers growing plants as feeding indirectly on air, when sustained immediately by vegetable manures. He was entirely right in his conclusion, though it was not reached by the proper course of reasoning, nor maintained on proper ground. Growing vegetables draw, by means of their leaves, a large portion of their sustenance directly from the atmosphere; and by their roots, they take up the solutions of vegetable matter, returned to the soil, (and then acting as manure,) and which had formerly, when alive, also drawn directly from the atmosphere the greater part of its sustenance. Thus, directly or indirectly, nearly all that serves to form vegetables, comes from the air, and is nothing more than new combinations of the constituent parts of the atmosphere. All that can be converted to charcoal, (and that is the frame-work, and fills the whole bulk of every tree and plant,) was formed of the carbonic acid absorbed by the leaves; and all the balance of the plant is composed of oxygen and hydrogen, the two elementary bodies which by their combination form water. All of the small

remainder, not thus derived solely from air and water, are the few earthy and saline parts, which are left as ashes after burning, and which form a very small portion of the entire weight of the plants.

But though plants draw so large a portion of their support from the atmosphere, they must be placed in good land, or be nourished by manure, to enable them to profit well by the supply of atmospheric food. If there was nothing in the earth to make a plant grow, it could draw nothing from the atmosphere. If it had barely strength lent it from the earth to make a small developement of growth, it might, it is true, derive three times as much from the air, and yet be still but a poor product. But let its power from the earth be increased four-fold, and in the same ratio, the atmosphere would raise the product ($1\times3=3\times4=$) 12 times more than its first capacity. Thus the more the land is enriched, in a much greater proportion is the crop enabled to draw benefit and support from the atmosphere. Hence, in one respect, the great profit of giving manure to land. But there is another reason why green crops for manure should not be raised and ploughed under, except there is already enough strength in the land to make a heavy growth. The expense of seed, for a manuring crop, will not vary materially, whether the land be able to produce one or ten tons of the green manure to the acre; nor will the labor of seeding and ploughing under be of much greater difference. Thus if the seed and labor on an acre of the poorest land would amount to $4, it would probably not exceed $6 on the richest, requiring such aid; and yet if the increased product of the first year gained on the poorest, was of the value of $1, it might be $6 on the richest land.

Clover is the most valuable of all mowing vegetables, not only because of its sharing the property and power of all the pea-tribe to draw sustenance largely from the air, but because its long tap-root also draws both moisture and food from a great depth in the earth. Its being a biennial plant also gives it greater product and enriching power from one seeding, than any annual plant has. But, on the other hand, its long occupancy of the ground gives opportunity for weeds and insects to multiply.

In a continuation of remarks upon this general subject, will be considered, 1st, the other grounds for choice between ploughing in vegetables when green, or after being matured and dry—and, 2ndly, the advantages and disadvantages of different schemes of rotations of crops, as tested by the views here set forth, as well as by the received general principles to which it is desirable that rotations should conform, as nearly as circumstances may permit. E. R.

PRIVATE CORRESPONDENCE, AND REMARKS ON PRIVATE MATTERS.

To the Editor of the Farmers' Register.

"*Columbus, Ga., Sept.* 5, 1839.

"By the request of John L. Lewis, I inform you that he does not take the Farmers' Register from the office, and says he does not want it, and further states that it was not sent to him by his request, so you will please stop it.

"J. A. SLATON, Ast. P. M."

We have been tempted to publish the foregoing notice, as it presents a sample of the mode in which sundry of our accounts with subscribers and debtors are *settled*. From the mere words of the above letter, a reader would infer that the Farmers' Register had been obtruded upon Mr. Lewis, by the publisher, without his order, or authority; and that he had given this notice, as soon as he was assured of the circumstance, by successive numbers being directed to his address. But such has never been our mode of seeking support, and we never have, without being so directed by some one supposed to be authorized, placed a name upon our subscription list, or sent, in continuation, our publication to any one, except as a present. Mr. Lewis' subscription was commenced for the fifth volume, which volume was *paid for* when the order was given, and *therefore*, we presume, by some person having authority. More than two years have since passed, and two more years' subscription are now due, ($10,) and after the issue of the 8th number of the second of these volumes not paid for, we received the above and *first notice of any kind*, from (or for) Mr. Lewis. It is not unlikely (though not so intimated) that he may at some former time, have requested his post-master to direct the discontinuance of a work to which he attached so little value; but if so, his order never was received, if indeed sent, and of course could not be known or obeyed. If such neglect of his request occurred, it was not our fault, and he is not the less indebted for the two volumes since sent to him—and, according to the conditions, for every future volume which we might choose to send, notwithstanding the present notice to discontinue, which has no validity, until all arrears due are paid. But *our settlement* of this claim will be as summary as that of Mr. Lewis, though less profitable to our interests. We simply erase his name from our list, and submit to the loss already incurred. We have no means of enforcing our most just and clearest claims against subscribers, and cannot but admit the truth, that against those subscribers who neglect or refuse to pay what they owe for subscriptions, we have no redress. We can only endeavor to lessen the number of non-paying "patrons," by erasing the names of all subscriptions long in arrear. We have but to beg of those who have merely fallen in arrear, not from intention, but because of inattention, or a common habit of procrastination, not to compel us to confound them with those the loss of whose names and subscriptions is a *gain* to the publication.

There is another class of *discontinuances* which are no less common, and of which the following letter from a post-master presents an example.

"*Mount Laurel, Va. 3rd April,* 1839.

Mr. Stephen Cronin, a subscriber to the Farmers' Register, at this office, has removed from

this neighborhood and gone to live some where near Lynchburg. He requests that the Register will be discontinued to him. The February number is now in my office, which he refuses to take out, and will be disposed of as you may direct."

When this notice was written, Mr. Cronin (who also had paid for vol. 5,) owed for vol. 6, completed, and for vol. 7 then in progress. A statement of his account was forthwith sent to his new address, Lynchburg, which has remained unanswered, and the debt unpaid, to this time.

THE FLORIDA KEYS, AND THE TROPICAL PLANT NURSERY.

To the Editor of the Farmers' Register.

Indian Key, T. F., 4th July, 1839.

I have the pleasure to transmit to you copies of the correspondence between the trustees of the Tropical Plant Company and the Honorable Secretary of the Navy, in relation to the introduction and preservation of especially the fibrous leaved plants.* You will perceive that the reply of the Hon. J. K. Paulding is as satisfactory as was expected; but when I reflect that under the successive secretaries of the navy during twelve years, not a single fibrous leaved plant has yet been brought from Mexico by our national vessels, which have returned from the Mexican sea every year; and that the heads of our departments generally retain their offices so short a period that they cannot carry into execution their own designs; and above all, when I consider how easily their express instructions are often evaded or thwarted by their distant agents, I cannot help fearing that many years will yet elapse before a cargo of living plants shall be transported in a national vessel to any portion of Tropical Florida.

In selecting the site of the preparatory nursery of tropical plants, the trustees were influenced by several considerations. 1st. Its vicinity to Indian Key. 2ndly. Its immediate proximity to the celebrated pits of water on Lower Matacumba. 3rd. Its central position along the reef; and 4th, the facility and safety of intercourse between it and the mainland. Indian Key itself is a beautiful little island, highly improved, and is both the most eastwardly settlement on the reef, and the village nearest to the mainland. The only other villages on these islands are those at Key Vacas and Key West, respectively 30 and 80 miles to the southwest. Indeed Key West itself is so remote from the peninsula that it may be geographically considered rather an appendage to Cuba than to Florida; north-eastwardly to Cape Florida, and thence northwardly 300 miles towards St. Augustine, there is not probably settled a single family. At the commencement of hostilities, there were many families in the vicinity of Cape Florida and of New River; but on the murder of Cobley's family by the Indians, they all fled from the mainland and many went to Key West, where they still reside in anxious expectation for peace to return. As then Indian Key was the only settled islet near the centre of the reef, the trustees were obliged to locate the nursery in its vicinity; and hence I proceeded to this village on the 25th December last, notwithstanding the written opinion of the department of war, that it would be unsafe to have my family here during the last winter.

As, however, I did not receive that opinion until my family were on the point of embarking from New York, I came on with the belief that in case of attack we could escape to Key West, and thence, if necessary, to the Havanna. During five months after my arrival, Indian fires were distinctly visible every week on the islands five to ten miles north; but these were represented to the females to be probably the lights of fires kindled by turtlers or fishermen. When the Indians shall be removed, the advantage of being under the *protection* of the population of Indian Key will also cease; yet other benefits resulting from its vicinity will always continue.

Under the second head you will at once appreciate the great advantages for a nursery of proximity to the only pits of water on the whole Florida reef, in a climate where moisture is the equivalent to manure. But as it is the only watering place for the wreckers, from Cape Florida to the Tortugas islands, you perceive that this circumstance also will be favorable to the nursery, both by facilitating intercourse, and exciting observation and inquiry. It is true that the sailors will occasionally do some damage; but some losses must be expected under all circumstances. In the wrecking vessels there are frequently intelligent invalids, who are cruising for the benefit of their health; and their curiosity will prompt them to examine the preparatory nursery; and all that it is requisite to ensure its success, is, that it should be seen by many persons when it shall be filled with valuable plants, adapted to flourish in the most arid soils.

Under the third head, by looking at a chart or map of this reef, you will at once perceive that Lower Matacumba is about midway between Cape Florida at the north-east extremity, and the Tortugas Keys, at the south-west extremity of the chain. The nursery is in full view of all vessels passing through the gulf along the reef, not more than 5 or 6 miles distant. From the seed and tool house at the garden, I have frequently seen five or six vessels at one view, and 15 to 20 in the course of the day. The entry from the gulf, inside of the reef, is several miles wide, and the water at the least 18 feet deep to within two or three miles at most from Matacumba. But the great advantage to the future planting and population of the reef resulting from the central location of the nursery, depends on the fact, that all the Keys are composed of the same single element of lime, and consequently that all the plants which flourish in the nursery will be equally adapted to flourish on all the other islands to which they can be extended in each direction with equal facility. As these will embrace all the valuable plants which are usefully propagated in the steril Bahamas, they can be hence best brought to this central site, and thence distributed over the equally arid Florida Keys. Our national vessels can also approach within three miles of the nursery, and discharge the plants they may bring, without a day's delay in the course of their return voyage home. Were

* This correspondence was received much earlier than this letter, and therefore appeared first, in a previous number of the Farmers' Register.—Ed.

it not for the obstacles interposed by the government of the United States, in confining a single monopolizing port of entry to Key West, at this very moment the nursery might have been filled by a cargo of living plants, imported direct from the Bahamas in private vessels to Matacumba. But so long as vessels for and from the Bahamas are obliged to clear and enter at Key West, 80 miles to the westward of the nursery, so long will it be impossible to get even from that district, in *safety*, a cargo of living plants, at the only appropriate time each year—the beginning of the rainy season.

Under the fourth head, you will perceive that Matacumba is within 25 miles of Cape Sable, and in the shortest direction due north not above 20 miles from the main land. Behind this outside range of islands the sea is very shallow to the main coast, many portions of it being dry at low water, and even in the deepest holes or channels not exceeding fifteen feet. The channels which run in irregular gullies through this shallow sheet of water will one day be the routes of small steamboats, which will ply between the keys and main land. This shallow sea, being sheltered by the outer islands, is perfectly safe for the smallest boats; and the Indians before the war generally resorted to Indian Key in their small canoes. Hence, comfortable flat bottomed boats can be constructed to carry on a safe intercourse between the islands and the south shore of the peninsula; and Mr. Howe has already a suitable one constructed for this very purpose, which is now in the employ of government, under the command of Col. Harney. The result of the whole is, that the preparatory nursery is conveniently situated for an intermediate depot of plants for, and from, the permanent nursery to be established on the main land.

Very respectfully,
Your obedient servant,
H. PERRINE,
Superintendent of T. P. C.

P. S. Can any person rationally object to the following propositions?

1st. Shipwrecked persons and property should have the *legal* as well as the moral right to seek the nearest and most convenient spot for safety.

2nd. Agricultural persons and plants should also have the *legal* as well as the moral right to avail themselves of every natural facility for populating and cultivating every section of our country.

3rd. That as a vast majority of the numerous wrecks along the Florida Reef occur at points between Cape Sable and Cape Florida, that hence ports of entry should be established at least every 50 or 60 miles, for the accommodation of wrecked persons and property alone.

4th. That as the highest considerations of national advantage require the speedy introduction and cultivation of tropical plants in Southern Florida, the ports of entry should be made for that purpose alone.

5th. That at all events these combined considerations require that congress should immediately establish two or more ports of entry at or near the southern extremities of the peninsula, and thus diminish the governmental obstacles hitherto interposed to the speedy salvage of wrecked persons and property, and to the speedy population and cultivation of Tropical Florida.

P. S.—By a transient conveyance from Key West, your numbers for April and May were received last evening, and were read by me every hour of the whole sleepless night. Your indelatigable industry, your enthusiastic zeal, your patriotic spirit, and your fearless language, all combine to ensure success to any enterprise in which your feelings may be enlisted. Your work on calcareous manures, received in May last, has opened to me a new world of observation, and of inquiry. The composition of that work alone must have required many years of laborious study; and indeed the subject of it is worthy of the dedication of the entire life of an enlightened agriculturist. But to appreciate that volume completely, it must be thoroughly studied, and to that pleasant labor shall hereafter be devoted many of my leisure hours. If possible, I would devote to it several hours every day, until I could furnish to you all the important facts relative to the growth of plants on this exclusively calcareous reef. Like the '*Bourgeois Gentilhomme*' of Moliere, who only discovered in his 40th year that he had been speaking *prose* all his life, so the people of this reef never reflected that they had been living in a tropical climate all their days, until they read my writings; and I myself frankly confess that I never duly reflected on the peculiarity of these exclusively calcareous Keys until I read your books. Yet, *a priori*, it would seem as little strange to expect that trees should furnish in beds of exclusively animal or vegetable manures, as that they should grow on these islands of exclusively mineral manure.

I am moreover exceedingly rejoiced that next to *lime* you appear to appreciate *water* as manure, and that you are hence republishing every thing showing the importance of water to vegetation—and especially the practical utility of irrigation in warm climates, where as Young says of Spain, "the *soil* is the least object, the sun and *water* do the whole," and that the effect of water upon the poorest land "infinitely exceeds that of the very richest manures that can be spread upon any land." In your Farmer's Register for November 1835, which you had the kindness to send me, there is no exaggeration of "the superior advantages in warm regions to be derived from flooding lands," contained in the translated article from page 484 to 490. When I shall have seen all that you may have published on this subject in your Register, should I find that I still possess some facts in store, worth republishing, they shall be at your disposal.

H. P.

SUCCESSIVE CROPS OF COCOONS IN TROPICAL FLORIDA.

To the Editor of the Farmers' Register.

While at Princeton, New Jersey, during the last week in July 1838, Judge Vandyke of that neighborhood presented me four strips of paper, each containing the eggs of a single moth. The papers were labelled as follows: No. 1, white cocoon of two-crop worm. 2nd, sulphur colored cocoon, or old Connecticut. 3rd, hybrid of male No. 1, and female No. 2. 4th, hybrid of female No. 1, and male No. 2. These silk-worms' eggs I immediately despatched by mail to the postmaster at this islet, but after my arrival here, on the 25th Decem-

ber, I forgot to make any inquiries concerning them until the 27th March, last. Mr. Howe then informed me that he had hung them up in his cellar, and had not seen them in many weeks. That cellar, however, is the basement and *bathing* apartment of the house in which I reside, *which is built over the sea*, and a most luxurious enjoyment does it daily, and even nightly, afford to my family. On examining the papers, I found that many eggs had already hatched, but in the following order: No. 3, the most. No. 2, the next. No. 4, the third, and No. 1, the least. Of No. 1, the eggs continued to hatch from 29th March, to 30th May, at five intervals of one day each, one of 2, one of 3, one of 6, one of 9, and one interval of 10 days. Of No. 2, the eggs continued to hatch from 27th March, to 7th April, at five intervals of one day, and two of 2 days each. Of No. 3, the eggs continued to hatch from the 27th March, to the 6th May, at seventeen intervals of 1 day, seven of 2, and three of 3 days. Of No. 4, the eggs continued to hatch from 29th March to 30th of April, at six intervals of one day, four of 2, two of 3, one of 5, and one of 7 days. As the girl who kept the record of No. 1, was sick part of the time, the record is imperfectly kept, and hence, with regard to the period of making the cocoons, I barely find that one worm ascended to spin on the 24th April, or the 27th day from hatching. Of No. 2, the worms ascended to spin from April 23rd to April 29th, at an average period of 28 days. Of No. 3, the worms ascended from April 23rd to May 6th, mostly on the 28th day. Of the hybrid No. 3, it was remarked that several worms were white, but all the cocoons were yellow; and of hybrid No. 4, that that none of the worms were *white*, but that *all* the cocoons were *white*. The period of the issue of moths from the cocoons of No. 1, was not noted. Of No. 2, the period noted were May 7th, 8th and 9th, or the 14th day after the ascent to spin. Of No. 3, the only periods noted were May 7th and 8th, or the 14th after the ascent of each. Of No. 2, the period cannot be now ascertained. As the records were kept by my wife and children, and it was their first essay, of course many omissions occurred, which will render my abridgement imperfect. The only account of the eggs laid, were those of two moths of No. 3, eggs laid on the 9th May, and of one moth laid the 14th May. There was also a particular record of the fact, that from a worm of No. 3, which ascended to spin on the 24th April, from its cocoon issued a female hybrid which coupled with a male of No. 2, or sulphur colored cocoon worms, and that the resulting *tribrid*, or *quateroon* eggs spontaneously hatched into worms the 20th May. On that morning 311 worms were found hatched; on the 21st, 58 more worms were found, and 36 eggs remained unhatched; and this day's worms and eggs were presented to a neighbor. These quateroon worms of the 21st May, were fed on the leaves of the morus multicaulis. On the 25th May the next record is made of the hatching of eggs. Thus hybrid No. 3, a white worm, ascended to spin, May 1st; from the cocoon issued a female moth, 12th, and coupled with a male moth from a *brown* worm of the same No. 3. Eggs laid 12th, and eggs hatched 25th May; nearly all hatched on the same day. These worms were fed on the leaves of the morus rubra; but these were the only eggs that have hatched of all laid by No. 1, 2, 3 and 4, in the month of July. Now, I will briefly add that the quateroon worms, hatched on the 30th May, did so well, that on my return from a visit to Key West, I found that several had begun to spin their cocoons on the 9th June, and that all had ascended on the 12th June.

As my boy of 12 years old attended the hybrid worms hatched the 25th May, and fed on the leaves of the morus rubra, they were neglected during my 12 days absence, and hence did not do so well; yet they also began to ascend on the 16th June, and continued ascending until the 20th June. From the cocoons of the quateroons, moths began to issue the 19th June, and continued issuing up to the 24th of June. From the cocoons of the hybrid moths issued the 27th June and daily to the 2d July. All coupled and laid eggs at the usual period, but on this, 6th July, not a single egg has yet hatched. The quateroon cocoons, third crop, are larger and finer than those of the hybrid cocoons from which the female issued. The hybrid cocoons, two-crop, fed on the native mulberry, are smaller, but the silk is finer, and several of the cocoons are of a glossy white. So many facts for the present. Their value and bearing will be seen by-and-by. Respectfully yours &c.

H. PERRINE.

MR. PHINNEY'S PIGGERY, AND FEEDING MANAGEMENT.

From the New England Farmer.

To the Editor.—Dear Sir—In compliance with your request I cheerfully devote a few moments to giving you an account of my piggery. I will premise, by the way, that the writer of an article which appeared some months since in the Yankee Farmer, and which I regret should have found its way in to many other papers, has greatly exaggerated the profits of my establishment. I have often stated, and now repeat, that the manure from my hog pens will pay for all the food which I *purchase* for them; the residue of their feed, by far the greater part, being the produce of my own farm.

When the average price of corn is one dollar per bushel, and potatoes 33 cents, and pork will bring 12½ cents per pound, I have no hesitation in saying that there is a handsome profit in raising pork for the market, *provided* the hogs be of the best breed. With such breeds I have always found that four quarts of Indian or barley meal, with an equal quantity of apples, pumpkins, potatoes or other roots well cooked, will give two pounds of pork. At this rate it will be perceived that there is a profit on the pork at the above price, exclusive of the manure the hogs make, which is of great value to the farmer, but by no means equal to the whole nor even half the expense of feeding.

My breeds are principally of the Berkshire full bloods, and a cross of this breed with the Mackey breed. This cross I have found decidedly preferable to the full bloods of either. I have an imported sow of the "Essex half black," being a descendant of the Berkshire, and highly spoken of by English breeders. The Mackey pigs were imported into this country from England some 15 or 20 years ago by Capt. Mackey, of Boston, and till within a few years were decidedly the best stock

in New England and perhaps in America. When first imported, Capt. Mackey, on his farm at Weston, not unfrequently brought them up to 600 lbs. at the age of 8 months. In all the essential points, such as maturing early, lightness of offal, greater weight in the more profitable parts, thinness of skin, &c., they greatly exceeded the Berkshire breed. But by breeding *in-and-in* as it is termed, they had greatly degenerated, had become weak and feeble in constitution, small in size, ill shaped, and in some instances deformed. With the exception of the human species, no animal degenerates so rapidly by this practice of breeding in-and-in as the hog. Judicious crossing is the only way by which a good breed of swine can be kept up and preserved. By proper attention to this principle, all good and valuable qualities of a breed may be preserved, and the bad rejected; without it, the best breeds will soon become worthless. With a view of restoring some of the good properties of the Mackey, I tried crossing them with various breeds, and with none have I succeeded so well as with the Berkshire. The produce of this cross possesses all the good and valuable points of the Mackey, united to the health, vigor and size, without any of the coarseness of the Berkshire. The best pigs, however, that I have ever raised, and I can say without hesitation, the best I have ever seen, were produced by putting a full-blood Berkshire boar to a sow which was a cross of Mackey with the "Moco," a New York breed, the progeny being half Berkshire, a quarter Mackey, and a quarter Moco.

My stock of fattening swine usually consists of about one hundred, besides about fifty stores [or stock swine.] My time for slaughtering is in February and March, when half my pigs are at the age of 15 and 16 months, being the fall and winter litters of the previous year, the other half being the pigs of the spring next previous to killing, and are at the age of 9 and 10 months. The former in years past have weight from 350 to 400 lbs., and in some instances as high as 500 lbs. The latter from 250 to 350 lbs.

An inquiry is often made as to the best time of killing, or what age it is most profitable to slaughter them. On a large farm where much green herbage is produced, and where the value of the manure is taken into the account, I consider the pigs killed at the age of 15 and 16 months as giving the greatest profit. When it is intended to kill them at this age, they may be kept on more ordinary and cheaper food for the first 10 ar 12 months or till within 4 or 5 months of the time of killing. The manure they make, and the extra weight of pork, more than pay the expense incurred in keeping them the longer time; but the spring pigs which are to be killed the ensuing winter and spring, must be kept upon the best of food, from the time they are taken from the sow until they are slaughtered.

The older class of pigs for the first 10 or 12 months, are kept principally upon brewers' grains, with a small quantity of Indian or barley meal or rice, ruta baga, sugar beet, &c., and in the season of clover, peas, oats, corn-stalks, weeds, &c,, they are cut green and thrown into the pens; the next four or five months before killing they have as much Indian meal, barley meal or rice, with an equal quantity of potatoes, apples or pumpkins as they will eat, the whole being well cooked and salted, and given to them about blood warm. During the season of fattening, an ear or two of hard corn is every day given to each pig. This small quantity they will digest well, and of course there is no waste. Shelled corn soaked in water, made as salt as the water of the ocean, for 48 hours, with a quart of wood ashes added to each bushel, and given to them occasionally in small quantities, greatly promotes their health and growth. Their health and appetite is also greatly promoted by throwing a handful of charcoal once or twice a week into each of their pens. Their principal food should, however, be cooked as thoroughly and as nicely as if intended for table use. From long practice and repeated experiments, I am convinced that two dollars worth of materials well cooked, will make as much pork as three dollars worth of the same materials given in a raw state.

Pigs when first taken from the sow should be treated with great care, to prevent scouring and from becoming stinted; when either of these happens, it will require many days, and sometimes weeks, to put them again into a healthy, growing condition. When first deprived of their natural food, a little new or skim milk, boiled and slightly salted, and given to them often and in small quantities, will prevent scouring, and greatly promote their growth. If intended for killing at the age of 9 or 10 months, they should be full fed all the time, and kept growing as fast as possible. If on the other hand they are intended for killing at the age of 15 or 18 months, they should not be full fed, nor be made very fat for the first 10 or 12 months.

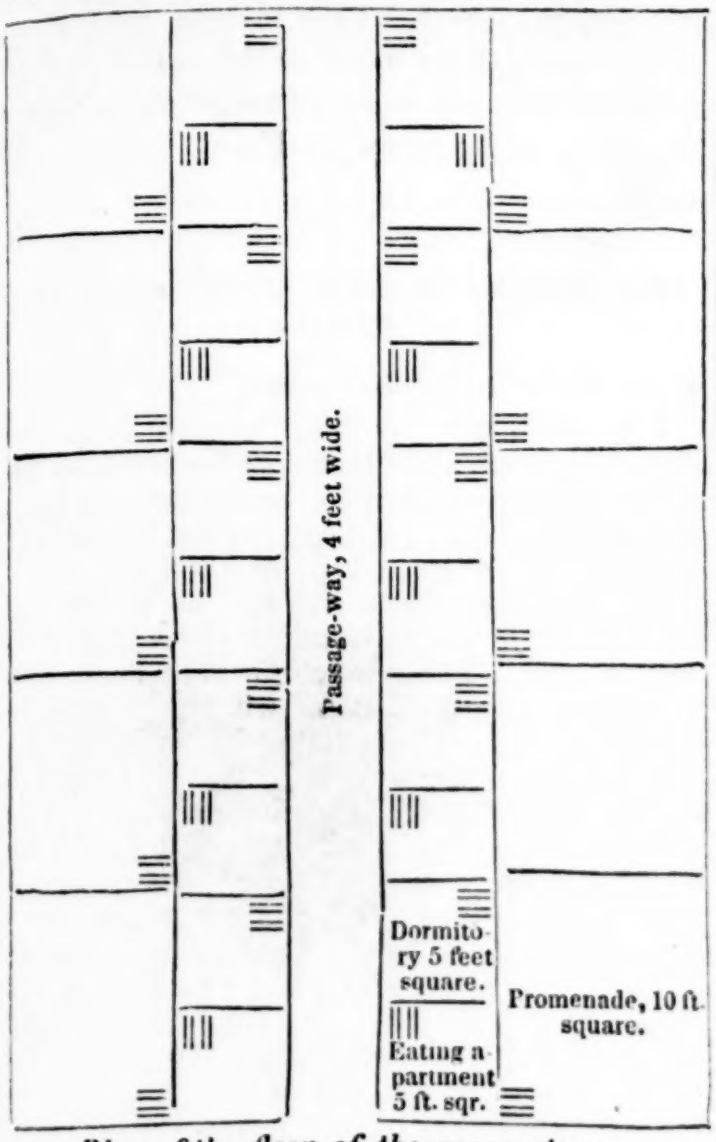
To satisfy myself of the benefit of this course, I took six of my best pigs, 8 weeks old, all of the same litter, and shut them in two pens, three in each. Three of these I fed very high, and kept them as fat all the time as they could be made. The other three were fed sparingly, upon coarse food, but kept in a healthy, growing condition, till within four or five months of the time of killing, when they were fed as high as the others. They were all slaughtered at the same time, being then 16 months old. At the age of 9 months the full fed pigs were much the heaviest, but at the time of killing the pigs fed sparingly for the first 10 or 12 months weighed, upon an average, fifty pounds each more than the others. Besides this additional weight of pork, the three "lean kind" added much more than the others to my manure heap. These results would seem very obvious to any one who has noticed the habits of the animal. In consequence of short feeding, they were much more active and industrious in the manufacture of compost, and this activity at the same time caused the muscles to enlarge and the frame to spread, while the very fat pigs became inactive, and, like indolent bipeds, they neither worked for their own benefit nor for that of others.

For the purposes of increasing my manure heap, my pens are kept constantly supplied with peat or swamp mud, about three hundred loads of which are annually thrown into my styes. This, with the manure from my horse stable, which is daily thrown in, and the weeds and coarse herbage which are gathered from the farm, give me about 500 cart loads of manure in a year.

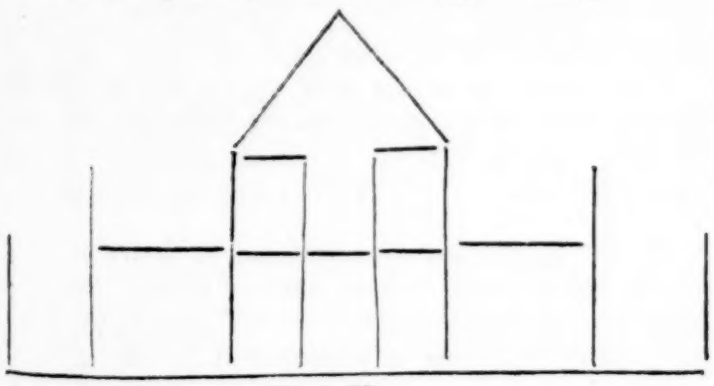
On regular and systematic feeding and clean and dry bedding, the success of raising and fattening swine very much depends. A faithful feeder, also, who has some skill and taste, and withal a

little pride of vocation, is indispensable. Homer informs us that much of the success of Ulysses in rearing his fine hogs, was to be attributed to his faithful Eumæus, whom the old soldier syled "god-like swine feeder."

The annexed is a rough plan, which may serve to give you an idea of the compact manner in which my hogs are kept. It is intended for a plan of the upper story and one end. The lower story corresponds with the upper, except that the promenade is extended out about six feet from the line of the upper outside promemade line.



Plan of the floor of the upper story.



End View.

The roof covers the passage-way and eating and sleeping apartments on each side, and is made sufficiently high to enable the feeder to pass between the pens. The floors of the eating and sleeping apartments are made perfectly tight—the floor of the promenade in the upper story is laid with narrow plank, placed about one inch apart, so that whatever is dropped by the pigs, falls through on the compost beneath. The promenade of the lower story has no floor. The only passage for passing the pigs out and in, is by a slide door between each dormitory and the main passage-way. The pen being on ground which is a little higher at the end where the boilers are placed than at the other, the floor of the boiler room is on a level with the passage-way of the upper story, where the pigs kept in this part of the building are taken in and out. At the other end of the building, the floor of the passage-way in the lower story is on a level with the natural surface of the ground; and by a door at that end of the passage way, the hogs in the lower story are taken in and out. You will perceive that a pen 100 feet long and 34 wide, with 3 in a pen, will furnish ample accommodation for 120 hogs, A passage-way for the feeder is made from the cooking room to the passage-way in the lower story,

Very respectfully yours,

E. PHINNEY.

REMARKS ON THE "DISTEMPER" OF CATTLE.

To the Editor of the Farmers' Register.

I have often been surprised that our agricultural periodicals should contain so little on one branch of husbandry, which appears to me to claim more importance than many others which are so zealously discussed. I would attach no blame to the editors of such papers, because they are dependent upon others for contributions of that sort. Among the numerous communications to agricultural periodicals, we look in vain for the remedies by which to preserve the life of a valuable horse, or perhaps a still more valuable cow, or a faithful and favorite dog.

Since the improvement of our domestic animals, particularly "neat cattle," (which from their great value, are commanding very high prices,) it is of no trifling moment to the farmer that he should have his flock swept off without the means of relief. It is almost impossible to put too high a value upon a good cow. For my own part were I an idolater, there is no created being better deserving my homage than the cow, a worship infinitely more meritorious than that so often bestowed on some church or political demagogue.

For many years, cattle in middle and lower Virginia have been subject to a disease familiarly called "distemper," or more technically, what I understand to be the same disease, the "murrain." Being ignorant myself of the nature of this disease I will neither undertake to describe its symptoms, or suggest a remedy. The object of these remarks is to elicit from some of your subscribers, or any others who possess information on the subject, whatever they can contribute for the public good. Each one may be in possesion of some facts, which, when combined or compared, may throw some light on the subject, and lead to some remedy, in which all are more or less interested.

Various opinions have been entertained of the probable cause as well as the nature of this disease. But to my mind there has been no plausible solution of it; but, on the contrary, much which is unsatisfactory, and even contradictory. There are some who maintain that it is owing entirely to promiscuous and indiscriminate herding on the commons. This, however, is at variance with the experience of many whose cattle rove at large, and mix with other flocks with impunity; while others confined within enclosures without oppor-

tunities for infection, die. Such was the result of my own experience this summer, in the loss of two valuable Durhams, which had never consorted with an infected flock. As an evidence moreover of one of the *inexplicables* connected with this disorder, I believe instances can be produced of certain locations, and certain herds, which have been exempt, while those adjoining have suffered, under similar circumstances, as far as could be observed.

Dry, hot weather, with lean pastures, have with some been thought to have some connection with this mysterious disease; while others have found that rich pastures have been more favorable to it, and that fat cattle have been more frequently the victims. This year particularly has been remarkable for its moderate temperature and luxuriant pasturage, and as remarkable for mortality of cattle, in this vicinity.

All, I believe, who have had any experience on the subject, will agree that few escape the disease, and consequently death, which are brought from the west to the east, even for twenty miles; and yet I believe it is a fact that a large portion of those brought at an early age from the north, or from England, will escape. On this particular, however, I should like to hear what is the experience of others.

Many of the best farmers in the middle counties of Virginia rely with very great confidence upon the free use of tar, sulphur and salt, during the summer months, as a preventive. It is hoped that amongst the many intelligent farmers who read your journal that some will give what information they possess relative to the *prevention*, as well as cure of this singular and mischievous disease.

In a trip which I lately made to the county of Nottoway, I met with a farmer of some experience who gave me some curious facts relative to the disease under consideration, some of which he derived from Mr. Wm. M. Watkins of Charlotte, (who I hope will favor the public with the amount of his information touching that matter.) Amongst other things it was thought, that the disease called "hollow-horn" and the "distemper" were connected, and very many cases were cured by certain remedies applied to the horns. This is certainly contrary to all the opinions which I had formed on the subject; my observation had led me to the belief that the former of these diseases was only to be seen in the spring of the year, when the cattle had passed through a severe winter, or had been badly fed; whereas the latter is seldom to be met with except in the latter part of summer or autumn, when they are generally fat.

Since writing the above I have conversed with a gentleman of this place who has considerable skill, or at least considerable reputation in the cure of this disease. He also entertains the belief that "hollow-horn" and "distemper" are the same disease, or, as far as his observation goes, are invariably connected. He often preserves their lives by boring the horns alone, without any further remedy. The horns are invariably found to be hollow, in which he usually introduces vinegar and salt. Perhaps there is a deleterious gas to which the operation gives vent; and if so, would not the chloride of lime or soda, be preferable?

The remedy on which he relies with perhaps still greater confidence is very free bleeding, but, to be successful, it must be used at a very early stage of the disease.

If I am not mistaken, my young friend, E. G Booth, of Nottoway, has had some experience which would be of use to the public on this subject. W. I. DUPUY.

September 23*rd*, 1839.

We add to the above our request to the two gentlemen named, and to any others who may possess light on this subject, to furnish it for the benefit of the public. There are few things less understood than this strange disease of cattle in this region; and few evils of such frequent occurrence, and certain loss to the farmer, have received so little notice, or investigation to discover the cause, or the remedy.—ED.

REMARKS ON MAKING GOOD PORK AND BACON.

To the Editor of the Farmers' Register.

I do not know any thing of more importance than fine bacon, and it is seldom found even in Virginia. First, to make good bacon, the hogs ought not to be confined, or kept too fat, during their growth. If hogs are kept at a still house, or in small pens, their meat will not be as firm and sweet as those that have run at large, with a variety of food. The sows ought to be managed so as to feed the pigs but one winter. I prefer for family use hogs to weigh from 125 to 150 pounds, and, usually, not to let hogs of that size remain in salt but about four weeks; a few days longer if the weather is very cold; and a week longer if the hogs are much larger. A great deal of bacon is injured by too much salt, and too much smoke. It makes it dry and hard. I put a small tea spoonful of saltpetre to every joint, and have it well rubbed in with the salt (in pickling tubs.) When the meat has remained in salt the four or five weeks, it is taken out, and while wet, the joints are rubbed with dry hickory ashes, and then hung up, and smoked once a day until it is dry, and then in all damp weather. To make good bacon, the hogs must be healthy and fat.

The same remarks will apply as to mutton. Do not put too many sheep together, and let them have as great variety of food as possible, and plenty of salt. A VIRGINIA FARMER.

P. S. I consider it important to know to what age a mare (well taken care of) will breed. I have an old brood mare, the half sister of Gohanna's dam, that has a young colt by her side, at twenty-seven.

THE MULTICAULIS MARKET AND PRICES.

Since our last publication, there have been but few sales of multicaulis trees, and the market has continued as dull, as that of all public stocks. Still, notwithstanding the general depression, and, in some cases, also *panic*, there have been very few, and those but small lots, sold at any lower than previous prices—and the greatest sale, by far, went off at prices enormously and unprecedentedly high,

for this season, considering the very small size, and necessarily small intrinsic value, of such trees. We speak of Mr. Physick's great sale. These small trees, at their average of 31¼ cents, were full as dear as trees of lower Virginia, of 6 feet average height, (or of any size, which would here be called a *good growth*,) would be at $1.50 the tree. Some other auction sales were made just before this, in different parts of New Jersey, and at lower *nominal* prices, per tree. But when compared, for size and quality, with our trees in this region, the former were sold for better prices, than any yet obtained here. Where there is such an enormous disproportion of size and value in the different growths, and stocks in market, of different regions, it is idle and ridiculous, as well as leading to conclusions altogether false, to compare the money prices, as if *a tree* were a fixed quantity in size and intrinsic value. The growth of summer-layers, of this part of the country, taken tree for tree, are larger and more valuable, than the lots of trees sold by Mr. Physick. For these reasons, difference of size and quality should never be forgotten, when comparing prices of trees, north and south. We copy the report of this very large and important sale from two Philadelphia papers.

"*Large sale of Morus Multicaulis.*—The annexed it is a correct statement of the number, prices, and proceeds of the Morus Multicaulis, the property of Mr. Physick, sold Sept. 18th, by C. J. Wolbert, Auctioneer, at the Highfield Cocoonery, Germantown, Pa. The trees were sold as they stood in the ground, those under 12 inches to be rejected. Owing to a thin soil and close planting, the sizes of the trees were generally small, and the branches few, the average height, according to estimates made on the ground, being about 2½ feet. The purchasers were generally from a distance, the largest portion being from Missouri, Illinois, and other western states. The prices, it will be seen, averaged 31 $\frac{23}{100}$ cts. per tree, equal to 12½ cts. per foot.

50 rows, averaging	1200, say	60,000	at 30 cts.	$18,000	00
20 do	do	1000, say	20,000	27½ cts.	5,500	00
10 do	do	1150, say	11,500	35 cts.	4,025	00
52 do	do	1150, say	59,800	37½ cts.	22,425	00
55 do	do	1150, say	63,250	32½ cts.	20,556	25
30 do	do	1200, say	36,000	25 cts.	9,000	00
1 do	do	1000, say	1,000	22½ cts.	225	00
10 do	do	850, say	8,500	17½ cts.	1,487	50
Whole No. of trees,			260,050 at 31 33-100		$81,218	75"

Phila. U. Gaz.

The bidding was very spirited, and the whole were sold in about half an hour. The buyers generally, purchased in very large quanties—and the prices, considering the quality of the trees, are enormous. The trees which sold at 17½ cents were not more then 18 inches high.

The jam of passengers in the cars was almost unparallelled, the number being so great as to require two engines to draw the train. It is supposed from 2000 to 3000 persons were present. The general result is, that Mr. Physick's sale has not only sustained all former prices of trees, but has in reality done a great deal more. Our repeated assurances that there was a western demand for trees is now abundantly realized, as the great bulk of these trees are purchased in Kentucky, Illinois, Indiana, Missouri, Ohio, and other western and south-western states.—*Morris's Silk Farmer.*

Proprietors of trees in this state, so far as we know, hold firmly for good prices; though the *asking* prices of the most sanguine have certainly been very much lowered, compared to their earlier and most extravagant expectations. The only very recent sales heard of are the following: The product of $100 worth of roots (600 roots) in Chesterfield, sold at $1000. Auction sales in Brunswick, (small amount,) trees 28½ to 35 cents. In Murfreesborough, N. C. 1000 trees, (from spring planted single-bud cuttings,) at private sale at 40 cents. These last were about 4 feet high on an average.

In the mean time, frequent and large engagements and appropriations of trees are making for next year's plantings, which serve to take out of the market very large shares of the whole growing stock. These are either contracts to furnish large numbers of trees in 1840, or arrangements to commence rearing silk-worms, which will require large plantings. From all these operations, we venture to predict that not one-third of the growing crop will come into market at all.

September 30.

The high prices obtained at Mr. Physick's sale are likely to have an injurious effect on the market. These prices, added to the previous panic, and consequent anxiety of many persons to sell, have caused an immense number of trees to be advertised for sale, and at auction, and for cash, or very short payments. This most impolitic course, of *forcing* sales six or seven months before they can possibly be wanted for planting, (their only use, so early,) will at least test the vital powers of the commodity; and if prices are not for a time reduced to one half, or to less, by this glutting of a before dull market, then it may be relied on that there is an intrinsic value in the article, surpassing the speculative demand, and that nothing *can* destroy its market. And this forcing of sales is to be done at a time when United States Bank post notes are selling at 24 per cent. discount, and the best public securities and stocks at prices unprecedentedly low, compared to their acknowledged value as investments; and when stoppage of specie payments by the banks is openly recommended by a commercial paper in New York, to alleviate the intolerable existing pecuniary pressure. If, under such circumstances, the producers of wheat were to insist upon selling the next surplus crop of the country, six months before it could be put to any use, it would certainly put down the price to less than half the expected future rates.

The result which this most unpolite procedure

may produce, of a temporary protraction of prices, would be as injurious to public as to private interests. The foundation of silk-culture is now laid so firmly and broadly, that nothing will prevent the structure being finally erected; and this would secure good prices for trees, not only for this year, but also the next, even if there were not a single individual speculator in the market. But a sudden depression, now, would cause the erroneous impression to be made on the public mind, that the advocates of silk-culture had lost confidence in its value and profits, and would thus serve at least to retard its general or extensive establishment. We believe that every tree raised in the country next year will be wanted to supply the actual demand for feeding silk-worms, or to make provision for the future feeding. And if so, the lowest price that can well be conceived, even 5 cents the tree, will give a very good profit to the planters of southern stock at 50 cents, or at the highest prices yet obtained, or asked, this season in Virginia. The general price of the young white mulberry trees in France, is a franc a piece, (about 19 cents,) though that kind has been cultivated there, for sale and for feeding, for some centuries. Why then, if wanted for use at all, should not the *morus multicaulis*, which is intrinsically worth so much more, and as early as 1840, sell for one-third at least, and more probably two-thirds, or more, of the regular price of *morus alba* in France? The occurrence of this result will not depend on the action of speculators, nor be prevented by a present depression of price, if caused by the means above mentioned; but will be founded on the actual operations of, and the certain and undoubted profits to be derived from silk-culture. With the success of this culture taken as a postulate, we may pronounce that every present holder of trees may safely withdraw from the market, keep his trees until next spring, (and standing in the fields, if in Virginia or more south,) if no purchasers offer sooner, and then, if not sold, convert the whole stocks to plantings; and he may count on greater profits from the crop than from pursuing the opposite course. On the other hand, it is not necessary to repeat, what we have often said already, that *without* the establishment of silk-culture, or its success being in certain prospect, the whole mulberry cultivation and trade would indeed be nothing but a bubble.

After the above was partly in type, we received the last Philadelphia Silk Farmer, by the mail of the 30th, containing the following editorial statement and remarks on the same subject.

"In relation to trees generally, we may inform our friends at a distance, that the high prices obtained for Mr. Physick's trees have induced many holders to advance theirs, and to make others firmer without advancing. On the other hand, many whose necessities are urgent, are forcing their stock into the market by auction and otherwise, for the purpose of obtaining money. We nevertheless know of various sales in the neighborhood of the city, at 50 cents per tree, and some farther off as high as 75. The pressure for money is severe beyond all former example; and seeing for ourselves how keen it is, the only wonder with us is that trees sell at all. Money in our market commands from two to three per cent. a month; yet the tree growers appear to think that buyers will borrow money at that extravagant rate to purchase their trees!

"Growers at the south should steadily keep in view one most important fact—their trees are far superior in quality to ours, and hence should command a proportionately better price. The prices obtained with us for the small sized and poorly branched trees of the north, ought not to regulate the prices of the large southern trees. Being better in quality they ought to yield a better price, and cannot fail to do so, unless prematurely forced into market.

"We know of several large sales of trees made in this city the present week, by private contract, at excellent prices, much higher than can be obtained at auction. The number sold is nearly 100,000. These sales would be more frequent, but form the disposition manifested by some persons to force off their trees. Our view of the whole subject remains unchanged, and we still believe there is a demand over the country which will take off all the trees at present in it. The scarcity of money may compel hundreds to defer their purchases until spring; but the demand at that time will only be the more active."

THE "CHINESE TREE CORN," OR THE "GRANT THORBURN HUMBUG," AGAIN.

Immediately after the earliest announcement of Mr. Thorburn's wonderful corn, which he sold, *for charitable uses*, at 25 cents the ear, we expressed our hearty contempt for the corn, and still more for the pretensions of its lucky *discoverer* and charitable salesman; and from time to time since, we have bestowed more of similar notice on the subject than its importance merited, in any other point of view than the boldness, and yet the remarkable success, of so gross and palpable an imposition on the credulity and gullibility of the agricultural public. Another reason for thus paying to Mr. Thorburn so much more respect than he would otherwise deserve, is, that by his superior performance in this line of business, he may be considered as the very head and front of the numerous class of humbug producers and salesmen, of the present day. Taking him therefore as the most excellent of the whole class, we use him as a hook on which to hang remarks applicable to the humbug business and its operators generally. We believe that we stood alone, among the conductors of agricultural and other journals, in *attempting* (for our effort was a complete *failure*,) to expose and put

down this proposed new plan of levying contributions on the credulous, for charity's sake; andthe good-nature of most editors even assisted the planner, by republishing gratuitously his advertisement, and some, also, in offering their additional eulogies of the corn, the charitable scheme founded thereon, and the great public benefactor who had discovered the one, and planned the other. But since the numerous crops have been made from the ears sold at 25 cents, and even $1 each, editorial as well as other censures are appearing, which if less harsh than ours, will at least amount, in the language of our brother editor copied below, to Mr. Thorburn's getting for his reward, figuratively, "more kicks than coppers." But the "coppers" are in his pocket, tangible and available—and the "kicks" are but figurative, and administered at such a distance, that their force is wasted in "thin air," and are neither felt nor regarded by one who is so encased in brazen armor, as to devise, and conduct to a successful issue, the "Chinese tree corn," humbug.

We copy below editorial articles from three different agricultural journals, which have been lately received.

"*Chinese tree corn &c.*—We have seen several crops of this corn, and our opinion of it is far less favorable than that of our correspondent. It is in our judgment, not only absolutely but relatively, worthless. It bears no comparison in value to several other varieties cultivated here. We believed it a humbug from the first, and refused to plant a grain of it. Whether it is *bona fide* of *Chinese* origin or not, is of no importance. The quality of the product is all in which we feel any interest. Does the "Chinese tree corn" answer the description of Mr. Thorburn? All that we have seen falls far short of it. There are some suckers shooting up from the ground, some of which, as is the case with the suckers of all varieties of corn, produce some grains, almost a nubbin if you please, at the end of the shoot. But is this bearing a ear at the end of the *tree-like branches?* We have seen it side by side with other corn, and all we can say for it is, that it has no peculiarity but its worthlessness. How easy it is to humbug and be humbugged! What is to be the great humbug of next year? There must be one or more; and we have been looking out for their announcement. In a month or two we shall certainly hear from them. Mr. Thorburn, if he can derive no other gratification from his patriotic distribution of this rare corn, can at least enjoy that of counting the money he received for it—or, it may be, in referring his conscience to the receipt given him by the secretary of the charitable institution to which it was understood he was to give the proceeds as a gratuity. The receipt no doubt, is carried in the nearest proximity to his conscience--in his *pocket.*--*Franklin Farmer, Aug.* 31.

"*Tree corn.*—This corn has been planted to a considerable extent and by a great many persons in parts of the state which we have visited. We have seen fields of it containing a quarter of an acre, and some more. It does not appear adapted to our climate, and there is a general disappointment in respect to it. We must not judge the case until the hearing is through; but much of it will require two seasons to ripen it, and we advise the cultivators to take it up, as is recommended in the case of the morus multicaulis, and set it out again next spring. If it lives and does well, we think it likely, or as the Dorchester schoolmaster said, "we presume to venture to hazard a guess," that they may get a crop next autumn. We are sorry that our agricultural friends are so disturbed with it. It seems to have "roiled" (?) the most philosophical. For his Withington wheat and his tree corn, we hope our friend Thorburn will not get as many "kicks as coppers." He has got the coppers—we are afraid from indications which we have seen, that he would get from some of our friends the rest of the change, if he should come too near to them. Brother farmers, keep cool! We cannot believe, we will not believe, that our friend Thorburn designed to impose a bad article upon any one, certainly not with any knowledge of the fact. The seed of this tree corn seems to have multiplied in the country like the pieces of the original cross in Europe, of which there is no doubt, that many, many cords have been sold by the priests as genuine, and "no mistake."—*New England Farmer, Sept.* 4.

H. C."

* * * "As we anticipated, the China corn is a complete deception practised upon the credulous and confiding public.

The evil done in playing off this money-making game is of a serious nature in its effects, and deserves the severest reprehensions. The price of the corn, and even the expense of cultivation added, which is much more, is but a trifle of the loss sustained by the community. The public is deceived, and this will lead to suspicions when new productions are announced, which might lead to agricultural improvement.

We believe that there is no such thing as the China corn, as described by Mr. Thorburn, to be found in the country—no corn of so large a size that will be fit to boil in two months from planting, under the most favorable circumstances of climate, season, soil and culture. We challenge any man to produce from any part of the world such corn. Some corn obtained, as we are informed, directly from Mr. G. Thorburn, is far later than he stated, making all due allowance for climate, season, &c.

We have some of the *humbug* corn, (this is a more appropriate name,) and it is as late as the Virginian, and is doubtless the same; we have seen much of it, and have had many accounts of it from different parts of the country, and it evidently is the southern corn. We saw some three and a half months after it had been planted in a favorable situation, and it was but just spindled. Other corn by its side was a month earlier, and yet this last was not so early as Mr. T. said the China corn was.

Mr. Sanford Howard, who ably conducts the agricultural department of the Zanesville (Ohio) Gazette, says he planted a part of two parcels of corn, *both from Thorburn's seed store*, New York, and that one kind was ten days later than the other; that the earliest was as late as that usually cultivated in that state, and there was no appearance of its branching out like a tree as stated by Mr. T. Some farmers observe that it will require two years to mature this corn."—*Yankee Farmer.*

But Mr. Thorburn will doubtless be much astonished, (even more so than he was at his own success in this plan,) to learn that there is yet a bolder adventurer than himself, who has seized on his famous humbug, and offers to run it a second year, for his own private benefit, disregarding the aforesaid Thorburn's just claim of priority of discovery, and also the claims of charity upon all the *net profits*. A Mr. Sangston [qu. *sangsue?*] of Maryland, has, in the American Farmer, given a most flourishing account of his crop made from his planting of Thorburn's seed, and offers to sell 2000 ears of the same, at Thorburn's last year's price of 25 cents per ear ! ! ! But this is a *little* too strong; and Mr. Sangston's movement is more to be applauded for its unprecedented boldness, and full confidence in the immeasurable gullibility of mankind, than it will be for its success. When it is considered what a great quantity of this marvellous corn was sold last year by Mr. Thorburn (or what passed for such,) and that every grain, so dearly bought, and highly prized, must have been planted and cultivated carefully, and that the increase must have been at least 500 per cent. upon the original charity stock, it can scarcely be believed but that the high price and ready market of the corn must be already as completely at an end, as is its high reputation.

In our last number, we called on Mr. Thorburn for "his report of the charitable purposes to which his great harvest of profit was to have been appropriated, according to his promise," and of which the public has heard nothing in the way of performance. As no such exhibit has been made, or appears to be forthcoming, and as Mr. Thorburn has continued most ominously silent on this subject, since the planting and selling season ended, we now repeat our call for a statement of the account current of "Chinese Tree Corn to Charity Fund, Dr.," and the receipts for the payments made in acquittance of the balance due. Though a brother editor told us that this hint of ours was "really too cruel," we still must repeat it. But as such an exhibit will probably be a difficult matter even for Mr. Thorburn to present, and as the settlement we doubt not has been *already made*, and the *balance fully paid*, we will presume to offer a form, which may serve the purpose, though of course the items are altogether conjectural.

Grant Thorburn in account with Charity,

Dr.

To cash received for 20,000 ears of "Chinese Tree Corn," at 25 cents the ear,	$5000 00

Per Contra.

By purchase made by him of 125 bushels of corn, the stock in trade, at 90 cents the bushel, - - - - -	$112 50
Cash for writing and printing puffs, on Chinese corn, and his charitable motives, paid in ears at 25 cents each out of his own private *extra* stock - -	488
Discount allowed to wholesale purchasers at 25 per cent - - - - -	1000
Reward of his ingenuity in inventing the plan of this charitable speculation	1000
Wear and tear of conscience and reputation incurred in conducting the same - - - - - - -	2399 50
Credits	5000 00
Debit	5000
Balance,	0000

CORRESPONDENCE.

[Communicated for the Farmers' Register.]

To Gideon B. Smith, Esq.

Sir—Among the many thousands of your countrymen who acknowledge your early, long continued, disinterested, and efficient services in urging and promoting the culture of silk in the United States—especially by providing the best means, by pointing out the peculiar value of the *morus multicaulis*, and inducing the propagation and extensive cultivation of that new and valuable tree—a few persons have united to provide, by subscription, some testimonial of their gratitude, and sense of your merit in this respect.

The duty of receiving and disbursing the sum subscribed was confided to the undersigned; and they have the gratification of now presenting it to you. They request its acceptance, not for the value of its amount, but for its object. A part of the fund has been expended to provide a tea and coffee set of plate, richly chased, and ornamented with suitable devices and inscriptions, and which will serve as a visible and permanent testimonial of the feelings and opinions of the contributors.

EDMUND RUFFIN,
THOS. S. PLEASANTS,
JOHN H. COCKE. } *Committee.*

Virginia, September, 1839.

Answer.

Baltimore, September 25, 1839.

Gentlemen—I have received your very kind letter of September, 1839, with the accompanying testimonial of the feelings of the contributors, consisting of a most splendid coffee and tea set of silver plate. I am unable to express my feelings on this occasion—feelings, I assure you, of unmixed gratification, and which are incapable of representation in words. I thank you and the gentlemen associated with you in this testimonial, not only for the matter, invaluable as it is, but much more so for the manner of it. From the beginning to the present time, I have had but one single object in view—the good of my country, my whole country, and nothing but my country; and I feel doubly gratified that, however humble my works may have been, my motives have been duly appreciated. It is now something upwards of thirteen

years since I have been devoted to the introduction of the silk-culture in the United States. I saw in 1826 that it could be made a profitable, and of course a valuable object of attention in the United States, even with the then known species of mulberry, *morus alba*. How much more certain I felt of its practicability in 1830 when I ascertained the valuable properties of the *morus multicaulis*, I leave you to judge. I pursued the subject with all my heart, and all my might, without ever once thinking whether I was to benefit myself in the smallest degree or not—from first to last I never once thought of self; and when I saw others making fortunes, it never occurred to me that I had omitted an opportunity of doing the same. Your most splendid *testimonial*, therefore, invaluable in itself, is still more precious to my feelings, from its coming to me unexpected and unsought for.

Be pleased to accept my most grateful thanks, and also to convey the same to your associates, with the assurance of a continuation of my exertions in the good cause, now rendered more than ever dear to me.

With high respect, gentlemen,
I am yours,
GIDEON B. SMITH.

To EDMUND RUFFIN, ESQ.
THOS. S. PLEASANTS, ESQ. } *Committee.*
GEN. JOHN H. COCKE.

Inscription on the plate.

TO GIDEON B. SMITH,

In testimony of his early, disinterested, and efficient services, in promoting the culture of silk in the United States; and especially in making known the peculiar value of the *morus multicaulis*, as the most important means, and inducing its extensive cultivation and use.

Since the last publication of prior contributions to the "Smith fund" the committee have to acknowledge the receipt of the following:

From Israel Kinsman of Philadelphia	$200
Edmund Ruffin, Jr. Virginia	75

ON EXTRAVAGANT AND SOUND ESTIMATES OF PROFITS OF SILK CULTURE.

For the Farmers' Register.

The experiment of the Rev. Mr. McLean of New Jersey, does not warrant the conclusion, that $1000 per acre may be realized from the culture of silk.

In the Farmers' Register, and other publications, I have frequently declared that such estimates of profit from the culture of silk, as that referred to above, are mischievous, and worthy of ridicule and contempt. I do not charge the publishers of such statements with insincerity and intentional misrepresentation. Very sincere and good men are liable, in times of excitement, to deceive themselves, and under the influence of self-deception to promulgate *theories* with a confidence of assertion that *facts* above can justify. Our cautious and calculating farmers are not in the habit of riding in balloons and *parachutes*, but are quite familiar with the sober realities that are found near the surface of the earth; and so far from crediting these extravagant estimates, they look upon them as truly ridiculous and contemptible; and unfortunately many of them include the culture of silk itself with these wild estimates, imbibe strong possessions against it, and regard it as a *humbug*, created for the purpose of speculation. If men who have no *facts* on which to base their calculations, must publish their theories, they should strive to keep within the bounds of probability.

The experiment of the Rev. Mr. McLean was *accurate*, and no doubt *faithfully* reported, and proves that 500 pounds of cocoons, or 50 pounds of reeled silk, may be produced from an acre, the same season that the morus multicaulis trees are planted. There is nothing wild or extravagant about this estimate; but to infer from it, that when the trees are four or five years old the product will be 200 to 300 pounds of reeled silk, in my view, manifestly shows the want of judgment.

Mr. McLean had on his ground, at the rate of 37,120 trees to the acre; and while I admit that trees planted thus closely might thrive for a single year, I know that the second or third year, they would become diseased, and the fourth or fifth year they would be likely to fare as Cobbett's cucumber vines, viz: "die of *natural starvation*." When the roots of the morus multicaulis begin to interlock, and contend with each other, the leaves become full of yellow veins and spots, and do not attain more than one-fourth their usual size, and are, of course, unsuitable food for silk-worms. I, therefore, think it apparent that Mr. McLean's experiment affords no foundation for *high pressure* calculations. Those who must have such enormous profits, had better go to work as Mr. McLean did, and report the amount of product in cocoons, or reeled silk.

LAYTON Y. ATKINS.

Stafford co., Va., Sept. 1839.

EXTRACTS FROM PRIVATE CORRESPONDENCE.

Gloucester, Sept. 15, 1839.

I have pursued the improvement of my farm with more spirit this summer than I have been able to do heretofore. Having succeeded in getting out my crop of wheat earlier than usual, I have been enabled to devote my whole force for near five weeks to carting out marl and marsh mud, before I was obliged to stop to pull fodder.

I have been able to go over such a surface, as surprises me when I look at it, having gone over fifty acres, and the manuring faithfully done. I had four tumbrils, and sixteen or seventeen hands at work.

The latter corn in Gloucester is surprisingly fine; the forward corn on the best lands being about an average crop. I have lately returned from the upper country, where I found the corn, every where I visited, as good as the land was capable of producing. The wheat crop in Orange and Culpeper is very bad; I heard of returns there the smallness of which would surprise even a lower Virginia farmer. Here the wheat crop has been a fair one; and as long as we can make from 10 to 15 bushels, after corn, by the aid of marl, we need not envy the upper country the boasted influence of plaster, which is inefficient here.

Beaufort, North Carolina, Sept. 8, 1839.

Your works have been a great source of information to me on the subject of farming; for by their instructions I have been enabled to raise on land that would not produce, 3 years ago, ten bushels of wheat to the acre, I have this year raised 25 bushels to the bushel sowed, done by liming my land and sowing down in peas. I have tried this year a few of the skinless oats, and I must say, they surpassed any oats that I have ever tried.

MONTHLY COMMERCIAL REPORT.

For the Farmers' Register.

No favorable change has occurred in commercial affairs during the present month. The scarcity of money has even increased, and is most severely felt in the northern cities, where the rate of interest is 1½ to 1¾ per cent. per month, on the best securities. The banks grant scarcely any discounts, and stocks of all descriptions are more depressed than they have been for many years. All descriptions of produce have fallen in price, and the spirit of commercial enterprise appears to be almost entirely dormant. This scarcity of money prevails also in Europe, where the rate of interest has nearly doubled. American stocks no longer find purchasers there, and those agents who went from this country to effect negotiations, meet with little or no success.

No mode of remittance from the south to the north now exists, unless it be by shipments of specie, which must return in the regular course of trade, attended with the expenses of transportation to and fro. In short, a greater derangement of money matters has scarcely ever existed. Public works are suspended for want of funds, and private enterprise almost paralyzed.

The result of the wheat harvest in England, although not ascertained with certainty, (on the 1st September,) was considered more favorable than by previous advices; and the consequence has been a decline in this country. The price of wheat in Baltimore is 100 to 105 cents; but owing to the very limited supplies in some of the Virginia markets, it still commands 105 to 115.

The crop of tobacco (of 1838) is now all at market. The inspections in Virginia show 28000 hhds. and the receipts at New Orleans a like quantity. In Maryland they are reported to be but 11000; but we have no accurate data.

The export to Europe since Oct. 1st, 1838, from

Virginia, is	19200 hhds.
From N. Orleans	15800
From N. York	5500

Those from Baltimore and other ports not ascertained. Prices in Virginia have not varied much during the month, and may be quoted $4 to $12, embracing all sorts of old. A little of the new crop begins to appear, but generally loose, in bulk, and is bought up by the manufacturers at about $6 for leaf. The crop will be large, and of good quality. That of Kentucky is reported to be much diminished by drought.

Of the old crop of cotton only 50,000 bales remain in all the ports; the closing sales are from 9½ to 12½. Supplies of the new crop began to arrive at New Orleans early in this month, but they will be retarded there as well as at Mobile, Augusta and Charleston, by the prevalence of yellow fever, which unfortunately rages with great violence this autumn. Although the crop of last year proves to be only 1,350,000 bales against 1,800,000 in the preceding year, the stock on hand in Great Britain is larger, and the price declining; so greatly has the consumption diminished this year. The first new cotton received at Petersburg and sold at 13¼ cents, is of fine quality, and such is supposed to be the character of the crop in North Carolina and Virginia. The season thus far has been favorable for maturing and gathering; but small progress in these has yet been made.

The crop of corn is abundant, and altogether the season in Virginia has been a most luxuriant one. Price of corn 62½ to 65 cents per bushel; bacon 10 to 12½ cents; apple brandy 45 cents. X.

September 28, 1839.

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